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TENTH

BIENNIAL REPORT

OF THE

STATE BOARD OF HEALTH

OF

MARYLAND,

FOR THE

TWO YEARS ENDING DECEMBER 31ST, 1893.

ANNAPOLIS:
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MARYLAND STATE BOARD OF HEALTH,
SECRETARY'S OFFICE,
JANUARY, 1894.

To His Excellency the Governor,
and the General Assembly of Maryland:

I have the honor to present herewith the Tenth Biennial Report of the transactions of the State Board of Health, in accordance with the provisions of the Acts of Assembly of 1874 and 1880, Chapters 200 and 483, respectively, which require that "the Secretary of said Board shall, at each regular session of the Legislature, submit a full report of his investigations, with such suggestions and recommendations as he may deem proper."

Respectfully,

JAMES A. STEUART, A. M., M. D.,
Secretary and Executive Officer.

MEMBERS OF THE BOARD.

(IN CHRONOLOGICAL ORDER.)

J. CRAWFORD NEILSON, C. E.....Harford County, Md.
J. M. H. BATEMAN, M. D.....Easton, Talbot Co., Md.
JOHN MORRIS, M. D.....Baltimore, Md.
JAMES F. MCSHANE, M. D.....Baltimore, Md.
Commissioner of Health (Ex-officio).
HON. JOHN P. POE.....Attorney General,
State of Maryland (Ex-officio), Baltimore, Md.
JAMES A. STEUART, A. M.. M. D..... ...Baltimore, Md.
JOHN H. JAMAR, M. D.....Elkton, Cecil Co., Md.

OFFICERS OF THE BOARD.

JOHN MORRIS, M. D.....*President.*
JAMES A. STEUART, A.M.,M.D. *Sec'y & Executive Officer.*

CHANGE OF EXECUTIVE OFFICERS.

A special meeting of the State Board of Health was held at the City Hall, Baltimore, on April 29, 1893, at which the resignation of Dr. C. W. Chancellor, late Secretary and Executive Officer of the State Board of Health, was presented by Dr. Jackson Piper (then President of the Board), which is as follows :

BALTIMORE, April 12, 1893.

To the President and Members
of the State Board of Health.

GENTLEMEN: Having been appointed Consul at Havre, France, I hereby tender my resignation of the office of Secretary of the State Board of Health, to take effect from and after the 15th day of April, 1893.

In severing our long and pleasant relations, extending over a period of nearly twenty years, I desire to express to you my cordial appreciation of your uniform kindness and confidence, which I shall ever hold in grateful remembrance.

In this connection, it may not be amiss for me to say that if, in the discharge of my duties as the State Health Officer, I have unwittingly given offence to individuals or communities, it has been from no lack of respect or consideration for their feelings and interests, but solely from an earnest desire to promote their material prosperity and happiness, in accordance with the teachings of modern sanitation, and my own abiding faith in its power to avert disease and death.

That I have at times failed to impress the public with the importance of the object in view, and have in fact occasionally incurred the displeasure, nay, more, the reproach, of those whom I have sought to benefit, is more a matter of regret than resentment, and I shall always look back upon the period of my official and personal association with the people of Maryland with feelings of the liveliest pleasure, and count myself happy in the belief that coming years will serve to demonstrate the sincerity of my purpose and the wisdom of my official acts.

Very respectfully,

C. W. CHANCELLOR, M. D.

After the reading of the letter, upon motion of Attorney General John P. Poe, the resignation of Dr. Chancellor was accepted, and an election ordered of a successor to fill the vacancy thus created in that office.

This election resulted in the election of Dr. James A. Steuart as Secretary and Executive Officer of the State Board of Health, and he assumed the duties of the office on May 1, 1893.

This change in the office of Secretary renders it necessary that the Biennial Report of the State Board of Health be presented in two parts, the first including a period of eight months (May 1 to December 31, 1893) and the second from January 1, 1892, to April 30, 1893, sixteen months, the latter being the records left by the retiring Secretary.

TENTH BIENNIAL REPORT

— OF THE —

State Board of Health of Maryland,

— BY —

JAMES A. STEUART, A. M., M. D., Secretary and Executive Officer.

1894.

INTRODUCTORY.

As eternal vigilance is the price of liberty, so also is it the price of health, and under this chosen motto the State Board of Health hopes and expects to fulfill the important mission for which it was created.

It is, therefore, with great pleasure and satisfaction that the Board is able to report through its Secretary that no serious epidemic of disease has occurred in the State of Maryland during the past two years (1892–93). This statement is confirmed by the reports of such of the County Health Officers as have been induced to send in their reports in time to be included in this report, and are herewith submitted.

It may be safely asserted that each biennial period, as it rolls around, has found the State in a better sanitary condition than it was at the preceding period, and that the good work done by this Board has borne abundant fruit.

The world over, wherever sanitary laws have been enforced, the death-rate has steadily diminished, whilst the effective force of an increased producing power has been correspondingly increased. The loss in earning capacity in all classes of workers is in exact pro-

portion to the amount of sickness which has prevailed during a given period of time. No better example can be cited than in the improved productive power of the people of the Eastern shore of Maryland, through the improvement in the general health of that section of our State. Only a few years ago the value of land in that section was at the lowest ebb, owing to a general reputation for unhealthfulness, whilst at this time farm lands have doubled and in some places quadrupled in value.

VISITATIONS BY THE SECRETARY TO THE COUNTY BOARDS OF HEALTH.

With a view to extending the influence of the State Board of Health, and of upholding, explaining and enforcing the Sanitary Laws of the State, the following communication was addressed in circular form to the Boards of County Commissioners (sitting as a County Board of Health) in each county of the State.

Responses were received from the following County Boards appointing the following dates for the consultation proposed by the Secretary of the State Board of Health: Frederick county, November 8th; Kent county, November 15th; Montgomery county, November 18th; Talbot county, November 21st; Howard county, November 23d; Wicomico county, November 28th (afterwards cancelled by them); Cecil county, December 5th; Queen Anne county, December 6th; Washington county, December 19th, and Garrett county for January 4th, 1894.

LETTER TO COUNTY COMMISSIONERS IN EACH COUNTY.

To the Honorable the Board of
County Commissioners of ..... County,
(at the County Seat, etc.)

GENTLEMEN: Since assuming the duties of Secretary and Executive Officer of the State Board of Health I have not had an opportunity of meeting the members

of the local boards throughout the State. I desire, therefore, to know you personally, and at the same time to come to some definite understanding with you with reference to the work which has been assigned by the Legislature to the State Board of Health and to the Local Boards of Health of which you are ex-officio members. Modern sanitary science has developed the fact that the greatest good to a community and State is to be accomplished by the prevention of disease in its inception and the discovery and checking of causes which lead to epidemics. This can only be done by those who are on the spot, and with this view the State Board of Health has been organized in such a way as to provide Local Boards of Health throughout the State, one in each county, consisting of the County Commissioners and other persons whom they may select or associate with them. It is very desirable that the Local Boards of Health should fully understand the scope of the work provided for them by the Legislature and be actively employed in carrying out the provisions of the very important, and, in fact, essential sanitary regulations which the law contemplates.

For the purpose of bringing all this before you and of coming to a definite agreement with reference to the prosecution of sanitary work in your county, I desire to visit you and meet your local physicians, judges and justices of the peace. For this purpose I would be glad to make an appointment with you at such time and place as would suit your convenience in your own county, and have a friendly discussion of these questions, with the view that we may become better acquainted and may unite in a harmonious prosecution of the very important work with which the State Board of Health is entrusted.

Kindly advise me of the time and place which would suit you to see me, and I would also be indebted if you would invite to be present on that occasion some of the

medical men of your county, the judges and the justices of the peace.

I have requested the attendance of these gentlemen as far as it is practical for them to attend our meeting, for the reason that all practitioners of medicine are charged with the performance of certain duties relative to the execution of the law, and the judges and magistrates with the enforcement of the same, on the complaint of the physicians and the State Board of Health. It seems, therefore, desirable that I should have the opportunity of discussing these matters with as many of them as can conveniently be gotten together at one time.

Respectfully,

JAMES A. STEUART, M. D.,
Secretary State Board of Health.

At each of these appointed meetings, held on the above-named dates (except Wicomico county, postponed, and Garrett county not yet due), the Secretary of the State Board of Health was most handsomely received, and the following is a synopsis of his remarks delivered before the above-named boards as well as those interested in sanitary matters who honored him by their presence. After reading the letter addressed to the County Commissioners, sitting as a County Board of Health, and expressing his thanks for the hearing accorded him, he said in part:

GENTLEMEN: Twenty years ago, when I first became connected with the Health Department of Baltimore City, Sanitary Science was but little regarded, owing to the meagre amount of knowledge on the subject at that day. I was even once asked by an old and highly respected physician what I meant, in one of my reports, by "Sanitation," and when I attended the first meeting of the American Public Health Association about the same time, it was spoken of in some newspapers as a "novelty of doubtful utility." All this

has happily changed through the efforts of such men as Dr. Sternburg, Dr. Steven Smith, Dr. Elisha Harris, Dr. Bell of the Sanitarium, Dr. Rouch, Dr. Baker, Dr. Chancellor and others, who have labored in this field without discouragement and have lived to see the fruits of their labor in the diminished death-rate of almost all of our chief centres of population and civilization. For instance, the death-rate in London, which twenty years ago was from 26 to 32 to the 1,000 of population, through the enlightened methods of modern sanitation, has been reduced to 16 and 20 per 1,000. In other words, one-half of those who died under former conditions have been saved. When the enormous population of London (nearly 6,000,000), with its slums and large pauper and criminal population is considered, these results are simply wonderful. And if all this can be done in London, with all its enormous difficulties and most unfavorable material to work upon, why cannot twice as much be done in smaller places where the best natural advantages exist? Far less crowding, the purest air, better and more abundant food and pure water. If all that is possible in the way of prevention of sickness were strictly carried out in such a country as this, with its salubrious climate, there should be no deaths except from old age and unavoidable accidents. Every one blest with a robust constitution should live to be 100 years old, in the enjoyment of unimpaired faculties and retaining a comparative capacity for usefulness.

Dr. Sternburg has lately established the fact that no child is *born* with Tuberculosis. Of course there are degrees of constitutional strength, and the children of parents who are diseased or have feeble constitutions have less vitality, and, therefore, less power of resistance when attacked by any of the diseases to which they may be exposed through the neglect of Sanitary Laws than those born of healthy and robust parents. It must be argued, therefore, that whilst it may be impossible to prevent altogether the ravages of disease

amidst the lowest order of inhabitants in a densely populated city, the good work that is done amidst the middle and better classes of society brings down the average to the astonishing figure of 16 to 20 in the 1,000 of total population. It is fair to conclude, therefore, that with all the unfavorable conditions eliminated as they are here, and all the means offered by Sanitary Science *faithfully availed of*, the death-rate of every such a community should be reduced to the lowest possible minimum.

The laws of Maryland relating to the prevention of disease and the promotion of the Public Health are, as far as they go, wise and effective. There is room for improvement, however, in this direction, and I feel sure that as each biannual period rolls around, the education of the people which we are all striving in season and out of season to extend and improve upon, will reach and penetrate the minds of our Legislators, and such laws as are defective will be amended, and such others as are needed will be enacted.

To recur to the more practical part of our task, I desire to call the attention of our worthy County Health Officers to the vaccine law contained in the revised Code of 1878, Article 25, title, "Public Health," subtitle, "Vaccine Agency," and to ask what progress is being made in the enforcement of vaccination in their various localities.

I fear the greatest negligence prevails in the counties in this matter of vaccination, and now that smallpox has again made its appearance in epidemic form in states touching our own borders, it is most important that there should be a general awakening on this subject. In order to bring this subject clearly before you, I deem it not inappropriate to quote that section of the law bearing upon it. Section 11 reads as follows:

Section 11. It shall be the duty of every parent and guardian to have his or her child vaccinated within twelve months after its birth, if it shall be in proper

condition, or as soon thereafter as practicable; and if such parent or guardian shall have any other person under his or her control or care, not duly vaccinated, he or she shall cause such person or persons to be vaccinated prior to the first day of November of each year. Any person failing to comply with the provisions of this section shall, on conviction thereof, forfeit and pay a sum not less than five nor more than ten dollars for each offence.

Section 12. No teacher in any school shall receive into such school any person as a scholar until such person shall produce the certificate of some regular practicing physician, that such applicant for admission into the school has been duly vaccinated. Any teacher so offending shall, on conviction thereof, forfeit and pay a fine of ten dollars for each offence, and no public school trustee or commissioner shall grant a permit to any child to enter any public school without such certificate, under the same penalty.

Section 13. All fines imposed under the provisions of this Act shall be recovered before a justice of the peace in the same manner as small debts are recoverable, for the use of the school fund of the county or city in which such offence shall occur.

I wish to call attention also to Chapter 155, Laws of 1882, entitled, "An act to provide against the spread of infectious diseases."

Section 4. And be it enacted, that any person who, while suffering from any dangerous infectious disorder, wilfully exposes himself or herself, without proper precautions against spreading the said disorder in any street, public place, shop, inn or public conveyance, or enters any public conveyance without previously notifying the owner, conductor or driver thereof, that he is so suffering, or being in charge of any person so suffering, so exposes such sufferer, or gives, lends, sells, transmits or exposes, without previous

thorough disinfection, any bedding, clothing, rags or other things which have been exposed to infection from any such disorder. shall be liable to a penalty not exceeding five hundred dollars, or imprisonment not exceeding twelve months, or both, in the discretion of a competent Court.

Section 5. And be it enacted, that any person, parent or guardian or other party, who carelessly carry about children or others affected with infectious diseases, or who knowingly or wilfully introduce infectious persons into other persons' houses, or permit children under their care *to attend any school*, theater, church or any public place where they will be brought in contact with others, shall be liable to a penalty not exceeding one hundred dollars for each and every such offence.

It is one of the gravest errors on the part of physicians to use the term "Scarlatina" in mild cases of scarlet fever with a view of allaying the fears and anxieties of parents or guardians. It must never be lost sight of that scarlatina and scarlet fever are one and the same thing, and that the most virulent and fatal form of scarlet fever can be and is frequently propagated from mild cases of so-called scarlatina. Isolation, therefore, is as imperatively demanded in these mild cases as it is in the worst forms of the disease. The law bearing upon this subject is clear and explicit and must be obeyed.

With regard to diphtheria, it has been well established that so-called membraneous croup is nothing less than laryngeal diphtheria and is quite as contagious as true diphtheria. The bacillus of diphtheria has been identified in the false membrane thrown off in so-called membraneous croup, and the true disease has been propagated from this source upon animals subject to the disease.

The danger of transmitting a contagious disease, such as scarlet fever, diphtheria, measles and whooping cough

is far greater than is generally appreciated. Even some physicians are careless or ignorant in this regard, and are responsible for the far-reaching distress and troubles that follow. Scarlet fever especially can be carried in the clothing, hair and in many other ways. It has been carried across the continent in the clothing of a child who had died of scarlet fever months before, and even in a beautiful tress of golden hair cut from the head of a little dead victim of this fatal disease, and in a letter written at the bedside of the patient. The books and playthings used in the sick room are most dangerous media. Domestic pets, such as cats and other domestic animals and fowls are known to be not only carriers of the contagion, but originators of true diphtheria. For a long time it was an inexplicable puzzle to physicians and parents as to the origin of diphtheria in the most healthy and isolated country residences among children who had not been away from the house or off the place in their lives, nor in contact with any person but the members of the family, and, when too, there was not a case in the whole county. This mystery has all been cleared up by the most positive demonstration of the fact that domestic animals and fowls *are* liable to diphtheria and *do* communicate the poison of this disease to those with whom they come in contact. We all know how fond country children are, in their isolated lives, of domestic pets. We see the little fellows hugging and carrying the cat or kitten or pet pigeon or chicken, and when their pets are sick this devotion is redoubled. A comfortable bed is made in the warmest corner of the kitchen or nursery, and the tenderest members of the family are brought in the closest contact with this direfully contagious disease. All doubt has been removed on this subject by scientific investigators, who have taken the membrane found in the nose and throat of both cats and fowls, and not only have identified with the microscope the bacilli or fungi of diphtheria, but have, through culture media, reproduced the same, and by

inoculation developed the disease in other small animals, such as cats and guinea pigs. This has been demonstrated over and over again, and in far distant parts of the country, by men working entirely independently of one another. The lesson to be drawn from this is, be careful about letting children have domestic pets, and when they (the animals or fowls) are sick, banish or destroy them at once if you value the lives of the precious children of the land.

The three essential features for the preservation of the health, are pure air, pure water and good food. Of course there are other adjuncts, such as comfortable clothing and correct habits, but the latter will be of little avail without the former. The air may be vitiated by decaying vegetable or animal matter, such as slaughter-houses, pig-pens or neglected drains.

It may be vitiated by over-crowding in schools, churches or other public places, in sleeping apartments or public conveyances, particularly immigrant ships.

All these pernicious causes can be removed by obedience to the laws of Health.

The second factor is pure water; and yet, alas, what an amount of ignorance and obstinacy exists in regard thereto. The general opinion is that if a water is clear and sparkling, cold and sweet to the taste, that it must necessarily be a good and pure water. This has proven a fallacy many hundred times over. Analysis has revealed lurking in this disguise the germs of typhoid, dysentery and other diseases affecting the intestinal canal. The cases of typhoid fever reported throughout the state can almost invariably be traced to the drinking water used at this or that locality.* It is therefore urged by the State Board of Health that all doubtful or suspected water be boiled before being used for drinking purposes, and when ty-

*"The report of the Committee" (at Dublin, Ireland, November 27th, 1893, ordered to investigate the causes of the numerous cases of typhoid fever occurring in that city during the past few years) "carries the conviction that the breeding ground of typhoid and similar malarial disorders is in a tainted subsoil, and that sanitary measures which overlook this source of pollution cannot eradicate the disease."

phoid fever has occurred, send a sample of the water (in a clean one-gallon demijohn addressed to Prof. W. B. D. Penniman, Analytical Chemist to the State Board of Health, Baltimore Medical College, corner Madison street and Linden avenue, Baltimore, Maryland), and it will be analysed and reported upon immediately at the expense of the State Board.

To recapitulate: Every community is open to the invasion of small-pox unless protected by vaccination, especially the children. Therefore vaccination *must not* be neglected. When a single case of scarlet fever, diphtheria, measles or whooping cough occurs in a family, isolate it at once and cut off all intercourse with the school or children of this or other families in the neighborhood, and no child should be permitted to return to school without a physician's certificate that all danger has passed; use disinfectants freely during and for sometime after the case has recovered or died; be very watchful over the diseases of domestic animals and fowls, and lose no time in banishing or destroying all such sources of contagion.

Keep a strict oversight of all the house and farm drains, as well as the proper disposal of all domestic waste. Specially guard the sources of your water supplies, even more carefully than you would your house from fire, or protecting it from loss by a fire insurance policy.

Such rules as these are the foundations upon which preventive medicine has been built, and whilst all this and more is well-known and understood by medical men, it is unfortunately known to and appreciated by but a small part of the general public. No opportunity, therefore, should be neglected to educate the people, and I look upon it as the duty of every physician and clergyman who have the opportunity of talking both privately and in public, to explain and emphasize the value and importance of the laws of health.

Respectfully,

JAMES A. STEUART, M. D.,

Secretary State Board of Health.

ELKTON, MD., December 14, 1893.

MY DEAR DOCTOR: In reply to your request for a report as to the general conditions of health or sickness that have prevailed in this county for the past year, I beg leave to furnish the following as given to me by the several physicians in the nine districts of the county with whom I have corresponded, and to whom I always look for information of the kind required:

In the First District. I learn scarlatina in a mild form has occurred in two or three localities; promptly suppressed by isolation and fumigation, and, in one instance, closure of school at Fredericktown by my order; some cases of measles. With these exceptions, no other contagious or infectious diseases have occurred. At this time, general health good; little in a professional way to do.

In the Second District. The report comes of some few cases of scarlatina in mild form; some cases also of intermittent fever; not a single case of typhoid fever, and the general health of the district better than in twenty years.

In the Third District. I would state that the general complaint among the physicians has been, a very limited amount of work has come into their hands. A few isolated cases of scarlatina, diphtheria and typhoid fever have occurred, but failed to make any progress, owing to prompt measures for their suppression. A good many cases of confinement, and a good deal of acute surgery in a minor way; but, other than this, the general health has been good. At this time there are a good many cases of the grippe in mild form, with no unpleasant or serious complications—housing, expectorants and tonics constitute the principal treatment.

In the Fourth District. The report comes, it has been distinctly healthy during past year; very little sickness and no epidemics.

In the Fifth District. There has been more than the usual amount of typhoid fever during this year; little or no scarlatina, whooping cough, measles or other contagious diseases. At present La Grippe prevails to an extent never before known in the district, but in a mild form.

In the Sixth District. Have had no epidemics in our district during the year; about half a dozen cases of sporadic cases of typhoid fever; otherwise have had no contagious or infectious diseases, except a few cases of measles.

In the Seventh District. The report comes referring to the outbreak of small-pox among the ice gatherers at Perryville last February; or, rather, it was among the people at and near Perryville with whom the ice gatherers were staying, and were thought to have originated from infected clothing brought to the neighborhood by men who came to the island from the city; was promptly suppressed by Dr. Stump by the use of the various means required, such as isolation, fumigation, cremation and vaccination. There have also been a few cases (isolated) of scarlatina, mild form; otherwise no epidemics of contagious or infectious diseases have occurred; a great deal of La Grippe in mild form prevails at present.

In the Eighth District. Largely and chiefly rural; nothing worthy of note to be reported.

In the Ninth District. The same character of territory, rural, same kind of report. In regard to vaccination owing to the frequent notice publicly given to the people by the school commissioners and myself as County Officer, from the reports received, I believe the law has been very generally observed and enforced. I am very sure, so far as the schools in this District are concerned, and I think in all the schools of the county, Ivory points were generally used, in some cases quills, and I am advised the vaccinations have been in the main effectual. I might also add that when my attention as County Health Officer has been called to

the existence of certain nuisances prejudicial to health, that the persons against whom the complaints were lodged have promptly obeyed the notices served on them for the suppression of the same. The fact is evident that in time the people will become educated to the importance and necessity for a more scrupulous regard for and observance of sanitary laws, and will be willing to accept suggestions and warnings more amiably than in the past, and a very gratifying reform be inaugurated in this direction.

I am very truly yours,

JNO. H. JAMAR,
County Health Officer.

CHESTERTOWN, November 28, 1893.

DR. JAMES A. STEUART,
Secretary State Board of Health.

DEAR SIR: As required by the Act creating local boards of health for the several counties, I beg to submit a brief report of the sanitary condition of Kent county during the year 1893.

This, in our county, has been one of the most healthy years known to me since I began the practice of medicine in 1877.

The various sections of the county have all been exceptionally free from sickness. This is especially the case as regards malaria and malarial diseases. When it was found that we were to have a crop of peaches, it was thought there would, of course, be rather more than the few isolated cases of this character observed in 1892, when we did not have a crop to market. There is no connection, of course, between such a crop and malarial diseases other than the fact, of large numbers of people from other sections, many of them known to be malarial, coming among us, living under very unsanitary and often depressing conditions, such as would be expected to develop whatever latent trouble of this character they may be harbor-

ing. There were indeed fewer cases than for many years.

I have had brought to my attention a less number of cases of typhoid than during '92, or for several years. In Chestertown it has been generally remarked that there have been no deaths and only a few cases of illness from this disease. This we believe is due to our improved condition from a sanitary standpoint. Our town, for a county-town, is in good condition, our town authorities and our town officers taking great pains and care to prevent unhealthy nuisances, and have co-operated with us to keep streets, yards and private properties in as cleanly a condition as possible. We have running through the main street of the town, for nearly half a mile, a large sewer emptying into Chester river. Another street, three blocks long, empties its sewage and garbage into the same. All of the latter street, with few exceptions, have private sewers and closets, which fact, together with an abundant supply of pure drinking water, adds to our healthy condition and lessens the chances of typhoid infection. As the residents tap the main sewer and put both drains and water supply into their houses, more and more good results are obtained, and thus improve their sanitary condition. Such parts of the town as cannot or do not have these conveniences are made to use the pail system. From a personal knowledge of nearly all the villages throughout the county, and frequent communication by letter and in person with the physicians of the small towns, I am able to say that they too are exercising more care than in the past, that they may be kept clean and healthy.

During the year the only epidemic of which I have a knowledge was one of whooping cough, lasting through the spring and summer. Chestertown had more than its share, but as we had had only a few sporadic cases of this disease for several years, it found an abundance of material ready to become affected. There was, however, only one case resulting

fatally, unless there were some not under the care of a physician. This is quite likely. There have been six cases of diphtheria brought to my notice, generally of a mild type. A number of cases of scarlet fever occurred in Worton district; this, too, I believe to have been mild. Still Pond, a village of several hundred inhabitants, has furnished several cases of scarlet fever. The school trustees and teachers of this village, as well as the doctors and residents, have shown themselves to be earnest and prompt in reporting and taking proper steps to limit the spread of the disease.

In the past some sections of Kent county had annually a great many cases of epidemic dysentery. Chestertown had many such cases; they have grown less and less, due, I believe, largely to our water supply, obtained from springs mostly pumped direct to the consumer, and when served from the reservoir, always clean and pure. Bowel troubles of various kinds have also grown less among adults.

The heated term of 1893, of course, brought with it its usual number (too large a number indeed) of summer troubles with young children and infants. Many of these cases I know positively to have originated from causes easily preventable, could mothers and nurses be made to understand that hygenic laws should be observed by parent and child.

There has been no case of malignant or contagious disease reported to me, as the health officer, without first soliciting the physician in charge. I am not aware of any law compelling them to do so in the counties.

Frequent requests have been made to me by householders, farmers and others, as to the best and most effective means of ridding themselves of insanitary conditions. I have always complied with such requests with pleasure, by letter, in person, and by publications of cards in the county papers. Through the papers I have from time to time given advice and instructions, doing this more particularly when I have learned of

the existence of any contagious disease in any neighborhood. I have also striven to impress in the same manner, upon the doctor, the parents and friends of such afflicted ones, the necessity of protecting the well. Were such advice followed, and did practitioners more fully and persistently urge this upon those under their charge, in our rural sections especially, contagious diseases would rarely obtain a strong foothold. This I am sure will not be done unless some more stringent law is passed (and enforced) than now exists.

During June, 1893, I urged a more strict observance of the vaccination law with special reference to the public schools and the negro schools in particular. I know that a large number of these children were then vaccinated who had been attending school contrary to law and no doubt many are still doing so, though I believe the school authorities endeavor to have the vaccination law complied with, but it is a difficult matter as far as these schools are concerned. In the fall of ninety-three the appearance of small-pox in neighboring states made it important that general attention should be called to the great importance of vaccination, and the danger of neglecting this most essential of all preventatives of a dreadful scourge. The habit of parents of not having their children vaccinated until they become old enough to enter school is both unfortunate and wrong, as many are thus entirely neglected, and others again simply have the virus inserted, sent to school and are thought and sometimes said to be vaccinated, without waiting to see whether or not the vaccination is successful, or as the law says "duly vaccinated." The practice of giving certificates in these cases, I believe to be now quite infrequent.

It has not been necessary for me to call the board of health together but once during the year. Such complaints as have been properly made in good faith have been dealt with quietly and satisfactorily without their aid or assistance.

I have had the usual number of anonymous com-

munications, which, of course, have received their just dues. These communications show that many people are willing to admit the existence of disagreeable conditions and sometimes real nuisances in their neighborhood, or perhaps on their neighbor's premises, but are not willing to have their neighbors know that they have complained. This fact keeps the board of health from often rendering assistance, and abating nuisances, where real good to the community would result.

Several instances of what promised to be disagreeable work have been smoothed over and the offensive conditions changed to healthy, pleasant surroundings, by simply serving written notices and giving instructions as to how this might best be brought about. Ignorance of what constitutes an unsanitary condition or surroundings is frequently to blame. This must necessarily be so, where we have so large a negro population as we have in Kent, and especially in Chestertown.

I am of the opinion that circulars and cards published in the county papers convey to the public clearer and better ideas, and greater good can through them be accomplished than in any other way; therefore I, from time to time, and on such subjects and such diseases as may at such times be most prominent before the different sections, publish a circular suited to the disease or circumstances whatever they may be.

I have in many instances also inspected premises, examined suspicious cases and abated nuisances upon personal requests.

There has been no unusual sickness nor epidemic within the county other than before mentioned.

Respectfully,

W. FRANK HINES,

Secretary.

CUMBERLAND, MD., December 29, 1893.

DR. JAMES A. STEUART.

DEAR SIR: Your letter received to-day. With regard to the condition of health of our city and surroundings, I would say that the summer was an unusually healthy one, but during the fall and winter months there has been considerable sickness. Diphtheria and scarlet fever have been prevalent during these months, and at times the former was very severe; some months we have had from 50 to 60 cases. The mortality has not been high, considerably less than in some cities. The mortality has been very small in scarlet fever, showing that the cases were mild. Typhoid fever, which has been very severe here in the past, has scarcely shown itself during the past six months; only in one locality of the city. We have not had any cases of small-pox. Vaccination receives attention, and the school children are all required to be vaccinated. We are trying very hard to educate the people in sanitary matters, and our board is active and vigilant as possible. I shall be glad at any time to furnish you with any information with regard to health affairs in our city. Very truly yours,

E. T. DUKE, M. D.,
Secretary.

HEALTH OF QUEEN ANNE'S COUNTY.

DR. BORDLEY'S REPORT TO THE HEALTH BOARD.

DECEMBER, 1892.

Dr. James Bordley, the County Health Officer, reported to the County Commissioners on Tuesday as follows:

GENTLEMEN: I herewith submit this, my first report, as secretary to the local board of health for Queen Anne's county, Md.

In the discharge of my official duties, since my appointment in May last, I have occupied myself more in

studying and surveying the field under my jurisdiction generally, in an endeavor to discover the weak points all along the line, than I have in waging actual war upon the enemy. "In time of peace prepare for war" is a maxim quite as applicable to sanitary as it is to military science.

The immunity from disease enjoyed by our people during the past year amounts to an almost absolute exemption, for even this salubrious climate and natural sanitarium. We suffered somewhat in the spring—in common with the world at large, during the pandemic—a slight outbreak of "La Grippe." Even that "fatal monster" was surprisingly handicapped and disappointed by the germicidal character of our atmosphere. So much so, indeed, that neither in the number of cases or in the type of the disease did our region suffer in comparison with many other places.

At one time we had reason to fear an epidemic of scarlet fever, but by the intelligent, willing and prompt co-operation of the families in which it appeared, we were successful in keeping it within bounds. I still hear occasionally of a sporadic case (appearing in different parts of the county), but so far not needing the aid of the health officer. The same may be reported of diphtheria.

Evidently this county will bear out the truth and correctness of Dr. Chancellor's recent eulogium of the Eastern Shore of Maryland. That it grows year by year more healthy can be fully demonstrated and sadly attested by an inspection of the Doctors' ledgers, as it will there be clearly shown, from their standpoint at least, how "distressingly healthy" it is.

Whatever may have been the reputation of the Eastern Shore of Maryland in former days, for all that the word paludal implies, we stand to-day almost entirely free from that ancient charge having emerged from beneath that shadow a full-grown and ruddy specimen of healthy manhood.

Malaria (so called) no longer claims the honor of

being "to the manner born," nor is it a plant or germ of indigenous growth, but with the general progress of the century, we have improved our soil by drainage, etc., until it has been stamped out forever, let us hope, and we are now prepared to offer to the world a country and a climate second to none for general healthfulness, and for many other of nature's best gifts to man.

The list of pulmonary diseases so distressingly common and fatal the world over is surprisingly abridged here. Both the acute and chronic forms of lung disease are quite infrequent. This fact is not only manifest and apparent in my own practice and observation, but is attested by the great body of the medical profession of the Eastern Shore, and also by the intelligent public.

Typhoid fever is a comparatively rare disease among us, there never having been an epidemic form of the disorder in any part of the county in my recollection.

Despite many and great disadvantages along the line of sanitary imperfection, in fact, frequently in actual defiance of the grossest violation of the most important laws of health, this life-giving atmosphere triumphs astonishingly.

As an instance, I would mention the following: Centreville, the shire town of the county, with nearly two thousand population, enjoys a water supply taken from a running stream at the northern end of the town, which stream receives the surface drainage of a water-shed, about a mile in length, from the source; not protected in any manner from contamination, carried without attempt at filtration directly into a reservoir, from thence, still without treatment, through the street mains to a stand pipe of ample capacity. This water—pure and undefiled at the fountain head, but not so when distributed—is quite generally used for drinking purposes, yet no ill results have developed therefrom.

In addition to this questionable water supply, I

must mention another fact, which being considered in the same connection, furnishes fresh cause for wonder and alarm, viz.: that there are no provisions whatever arranged for getting rid of the great waste from this abundant water supply, no sewerage of any kind, and at many points no gutters to carry off even the surface water, &c. In some instances abandoned wells are converted into cesspools for the reception of this waste, yet for all this we have had no warning, so far, of the dangers ahead, and awaiting their opportunity, not even by an isolated case of sickness traceable to this cause; or from the drinking of water from the wells, still used for this purpose, though the uniform depth of all these wells would point significantly to the possibility, if not the probability, of contamination from the before-mentioned cesspools.

In the further discharge of my official duties I have inspected both the jail and the almshouse, and also many of the school-houses of the county. I am prepared to report them in most satisfactory condition, being kept in a manner entirely comformable to the most exacting sanitary laws. I would especially commend the "Board of Trustees of the Poor" for the painstaking, intelligent and careful attention they bestow upon the institution and the inmates. A careful examination of the building and its surroundings disclose such a remarkable condition of cleanliness and order that I found no occasion for wonder when an inspection of the inmates revealed an unusual degree of healthfulness and happiness. The humane and efficient "overseer" and his wife (the matron) must, of course, come in for a full share of the credit for this satisfactory condition of things.

There has been erected lately on this property, adjacent to the almshouse proper, a commodious brick building, intended for the reception of the pauper insane of the county. I am not prepared at present, however, to endorse this measure as a desirable departure, for I have serious misgivings as to the future

success of the undertaking. Without a building practically constructed and scientifically designed for the special purpose, which I fear this will not prove to be, and in the absence of a resident alienist and trained nurses, I cannot clearly see how these poor unfortunates will profit by the proposed change, especially the class of cases that, under proper modern management and treatment, are yielding an ever increasing percentage of recoveries.

I have issued through the public press frequent notices on sanitary and other matters during the year, calling the attention of the public to the importance of intelligent and eternal vigilance in the observance of the laws of health, pointing out the dangers and suggesting the remedy whenever possible.

The subject of general vaccination has received particular attention, especially the branch of the subject coming under the vaccination act. I have reason to be much surprised to find with what astonishing indifference this law is treated by intelligent people, many children attending the schools without certificates, in open violation of the law.

The most reprehensible custom, however, in this connection, is the practice of some of the physicians here in issuing unqualified certificates to children, as being "duly vaccinated" at the time of the insertion of the virus, in many instances never again seeing the child, and, therefore, leaving it quite frequently unprotected. Under the letter of the law, a teacher must accept these certificates, although he may know at the very time the statements therein contained are not true. I was told to-day by a public school teacher that she had, to her knowledge, twelve or fifteen pupils attending her school who held certificates, but whose vaccinations had never "taken," and this is but one of many similar instances. Would it not be well, at the next meeting of our Legislature, to have the phraseology of this law so modified as to relieve it of the ambiguity whereby now these "broad constructionists"

find something behind which to hide themselves while practicing their peculiar methods? I enclose you herewith the form of certificate I use.

In obedience to the law, under which I am acting, I have kept a record of the proceedings of our local board, and of my own official acts, which I have the honor now, imperfectly collated, to submit to you. By thus rendering you the results of my stewardship, if I may have added anything either of value or of interest to the sanitary statistics of my State, I will be contented, although it may be small.

JAMES BORDLEY, M. D.,
Health Officer for Queen Anne's County.

DR. BORDLEY REPORTS THE HEALTH OF THE PEOPLE AS UNPRECEDENTED.

The report of Dr. James Bordley, the local Health Officer, submitted to the County Commissioners last week, makes an excellent showing as regards the healthfulness of the people of this county. It is as follows:

DECEMBER, 1893.

To the Board of Health for
Queen Anne's County, Maryland.

GENTLEMEN: By the law under which I am acting as your secretary, it becomes my duty at this time to make my second report respecting the health of the county for the past twelve months, therein, reporting to you, as the County Board of Health, the extent and character of the work I have performed as one of the Local Health Officers of the State, thus contributing our part of the State's Sanitary Statistics.

In this report, however, I can do little more than recapitulate the items of my first report, which I have just read as part of the minutes of to-day, and which I had the honor to submit to you twelve months ago.

Nothing of interest or importance, touching the healthfulness of the county, has occurred to change the opinions therein expressed regarding the usual and extraordinary freedom enjoyed by the people (the laymen) of this section of the State from diseases of every class and character. If I am to alter at all the statement of that report, on this point, it will only be to add the experience of another year in proof and support the statements therein made. My observations, both as Health Officer and as practitioner of medicine, seems but to reflect the common experience of the profession throughout this county, that this has been, of all recent years, the most unprecedentedly healthful one. I am sure the gentlemen here present will bear me out.

In the performance of my official duties, I have visited frequently the jail and almshouse and can report them both, as I did a year ago, in a healthful and sanitary condition. I have also visited many of the towns throughout the county. I have responded either by letter or in person to every authorized notification received touching health matters, and I am gratified to report the sanitary condition of most of the points so investigated as satisfactory.

I have, from time to time, issued notices through the public press of the county on health matters, and I am also gratified to be able to testify to the willing and liberal co-operation on the part of the managers of these journals to join me in disseminating information and warnings upon these important subjects.

Not wishing to consume your valuable time any further with this imperfect and hasty survey of the field under my jurisdiction, I will now yield the occasion to my superior officer, Dr. James A. Steuart, Secretary of the State Board of Health, who is with us to-day for the purpose of consultation and advice touching this all important matter of health.

His duty, however, at this time bears a two-sided

relation to this community, one toward the laymen and the other (last, but not least) towards his poor professional brother, and as the facts just detailed and substantiated show nothing for our leader to do, worthy of distinction, along the line of prophylaxis in this region of perpetual health, it becomes at once evident that his special skill and knowledge, to be effective, must be exercised in the direction of the second branch of this question, and that he shall leave behind him such a code of instructions and suggestions as may hopefully and certainly lead *us* on to better things in which both we of the local profession, as well as himself, shall soon be enabled again, honestly, if not brilliantly, to earn our daily bread and our salaries too.

JAMES BORDLEY, M. D.

CENTREVILLE, MD., December 13, 1893.

MY DEAR DOCTOR: The reports requested are herewith enclosed.

I am sorry they are not fuller, but they were only prepared for home use. The typographic errors of course you will understand.

The insane department of our almshouse, you will remember, I stated as being a greater success than my first report predicted; but even now I am unwilling, for reasons already given, to endorse the union of insane hospitals with county almshouses.

I wish you would impress still further upon our Board the urgent necessity of a thorough vaccination, at this time, throughout the countr. I am sure that 20 per cent., if not more, of the children under five years of age, are unprotected, not to mention those requiring revaccination, adults as well as children.

While the present law requires every physician, under penalty, to perform all pauper vaccinations *presented to him*, it does not require or contemplate that the unprotected shall be hunted up, which is in

fact the only way to reach a certain very large class of every community, and the very element most needing it.

I would suggest that you request our Board to appoint one physician in each and every district of the county to do this work, and require them to do it in a reasonable time and in a proper (duly) manner, not only the work, but the canvass, so that they go out into the highways and hedges and compel them to be saved.

This suggestion will come with more force from you than from me. Sincerely yours,

JAS. BORDLEY.

To Dr. James A. Steuart,

Baltimore, Maryland.

Montgomery county is admirably located for health, owing to its great altitude, being more than five hundred feet higher than Washington City. It has, however, many other attractions besides its great height. The country is beautifully rolling, well wooded, abundantly supplied with large, never failing streams and innumerable springs of delicious health-giving water. Yet, with all these advantages, we have not been entirely free from diseases of various kinds. During the summer some bowel affections, not often fatal, and in certain localities there were many cases of typhoid fever, which, in some instances, resulted in death. La Grippe, during the months of November and December, has prevailed as an epidemic, not many cases, however, proving fatal.

C. J. MADDOX,

Secretary Board of Health, Montgomery Co.

East New Market, Dorchester Co., Md.,

December 18, 1893.

Dr. James A. Steuart.

Dear Sir: I repeat that the health of Dorchester county for the past two years has been excellent. No epidemic, very little malaria, schools in good sanitary

condition. The vaccination law generally complied with.

Yours truly,

GEO. N. JONES, M. D.,
County Health Officer.

OFFICE OF THE SECRETARY
BOARD OF HEALTH, BALTIMORE COUNTY,
WETHEREDVILLE, MD., Dec. 22, 1893.

DR. JAMES A. STEUART,
Secretary State Board of Health.

DEAR SIR: In reply to your letter of the 14th inst., requesting a "report as to general conditions of health and sickness that have prevailed in Baltimore County during the past two years," we are pleased to say that there has been an unusual degree of good health.

There has been no serious outbreak of any of the contagious diseases.

Scarlet fever, measles and diphtheria have appeared in various parts of the county, but at no time have they assumed an epidemic form.

La Grippe, which has prevailed more or less extensively throughout the county since 1889, has made its appearance here again, this winter, in a somewhat modified type. Typhoid fever has been less prevalent than during previous years. Vaccination has been more general during the past year, but it is not as thorough as it should be. Very little attention seems to be given to the law which requires a child to be vaccinated within six months of its birth, and many parents neglect having it done until a certificate of vaccination becomes a requisite precedent to the child's admission to the public schools.

During the past two years more attention has been given to the sanitary affairs of a number of small towns and thickly settled portions of the county, and an improvement in the health of these localities is apparent.

The energetic efforts of the Board of Health, with the dissemination and discussion of hygienic principles

by the public press, has had a wholesome effect in awakening many persons to the dangers of an impure water supply, the careless disposal of garbage, and the improper location of outhouses.

Very respectfully yours,

J. C. MONMONIER, M. D.,
Secretary Board of Health Baltimore Co.

EASTON, December 29, 1893.

DR. JAMES A. STEUART,
Secretary State Board of Health:

In compliance with your request, it gives me pleasure to state that we have had very little sickness in our county for the past two years.

Last winter, 1892–'93, an epidemic of measles prevailed, and, notwithstanding the type of disease was anything but mild, there were very few deaths, those occurring among people who were well advanced in pulmonary consumption. As far as my information extends, I do not know of one case of pneumonia that followed or complicated the disease. We have been peculiarly exempt from pulmonary diseases. In regard to intestinal troubles among adults and children, I have very few cases to report, and that of a mild type. During the months of November and December we had a few cases of scarlet fever in the town of Easton, Md. By prompt and efficient measures the disease has been stamped out, we hope. We have had several cases of typhoid fever, confined, however, to two houses. The source of the disease we have been unable to find.

The two canning establishments north of the town, on account of the dry weather during the summer, caused an intolerable nuisance, owing to the waste from each undergoing decomposition and polluting the air with noxious odors. There was so much complaint, and justly so, that I must call your attention to the nuisance, so that some means may be devised by which the town can be rid of it. As long as we have copious

rains there is no trouble, because everything is washed away. I have paid particular attention to vaccination. The vaccine physicians appointed by the County Health Board have performed their duties well. The school board issued orders to the teachers to allow no child to enter school without a physician's certificate that he or she had been vaccinated. The teachers have complied with the order of the Board.

As far as malarial fever of the intermittent and remittent types are concerned, we rarely have a case to treat. This absence of malaria is worthy of study and investigation. The stereotyped explanations in regard to ditching, drainage, etc., wont do, because the same exemption prevails in places that were noted for their unhealthfulness many years ago, and where nothing has been done in the way of sanitation and hygiene.

Very respectfully yours,

J. M. H. BATEMAN,
County Health Officer.

LEELAND, P. G. Co., MD., December, 1893.

JAMES A. STEUART, M. D.,
Secretary State Board of Health.

DEAR SIR: I have to report favorably, in regard to the healthful condition of this county, during the past two years. Typhoid fever, malignant diphtheria, dysentery, etc., have been far less prevalent in the epidemic form than in former years. The majority of such diseases have been sporadic, and in some instances the cause could only be attributed to an inherent predisposition upon the part of the subject. The majority of cases could readily be traced to unsanitary conditions, of which, pig-pens, contaminated well-water, and badly ventilated houses, constitute the most prolific sources of contagion. Frequently we find the milk and drinking water, kept in small apartments, used for laundry and culinary purposes, calculated to contaminate the atmosphere also of the sleeping apartments of the small house. I have thought

that many diseases have been conveyed through clothing so frequently laundried by negroes in their small and crowded houses, and in the majority of instances, where milk and water become a source of infection, they are impregnated within the walls of such apartments.

Much has been done towards the prevention and suppression of diseases, of an infectious character, by the Board of Health, through their officers, who alone have the power to investigate the premises, remove nuisances, insist upon disinfection, and the burial of excrement from the sick. Teachers in the county schools are required to exact a certificate from pupils (furnished by a physician) in proof of their having been (effectively) vaccinated.

BENJ. L. BIRD, M. D.

WETHEREDVILLE, MD., Dec. 31, 1893.

DR. JAMES A. STEUART,

Secretary State Board of Health.

DEAR SIR: On the receipt of your letter of the 26th inst., I wrote Drs. Macgill, Wysham and Mattfeldtt for the information you requested in regard to the cases of diphtheria in Catonsville.

The two former replied that they had written you a full statement of the facts, and Dr. Mattfeldtt stated that he had two mild cases of diphtheria which he supposed may have been caused from contact with persons who were connected with some of the other cases. I concluded from the letters of Drs. Macgill and Wysham that you were in possession of all the material facts, and I have made no further investigation. Respectfully yours,

J. C. MONMONIER,

Secretary.

EASTON, July 1, 1893.

DR. JAMES A. STEUART,

Secretary State Board of Health.

DEAR DOCTOR: In compliance with your request, I submit my report for the last three months:

Measles, whooping cough and chicken-pox have been prevailing diseases during that period. There were a few deaths from measles complicated with tuberculosis. There were no pneumonia complications, although the type of disease was severe and covered the entire county. We have been singularly exempt from pneumonia for several years past, no matter the character of the prevailing sickness, measles, La Grippe, etc., yet no cases of pneumonia have developed as far as my information extends. Recently we have had mild attacks of diarrhea from imprudence in eating. No fevers, either malarial or typhoid, to report. The health of the county is excellent, and the sanitary condition of Easton good.

Very truly yours,

J. M. H. BATEMAN,

Health Officer for Talbot County.

WESTMINSTER, MD., July 5, 1893.

JAMES A. STEUART, M. D.,

Secretary State Board of Health.

DEAR SIR: It affords me pleasure to report the sanitary condition of Carroll county to be excellent. We have no epidemic now, and have not had anything, except measles, that could be called one. Very little scarlet fever or diphtheria; no typhoid as yet. We were never so free from all kinds of sickness.

Respectfully,

J. H. BILLINGSLEA, M. D.,

Health Officer for Carroll Co., Md.

Elkton, Md., July 8, 1893.

My Dear Doctor: In compliance with your suggestion, I herewith forward copy of the report of the sanitary conditions of our county, more particularly of this vicinity. Also in regard to the healthfulness and prevailing diseases, if any, of my district, during the past three months; with two or three exceptions we have been happily free from any visitations from epidemics, and that fairly good health has prevailed in this section. There have been the usual amount of obstetrical cases, less rather than usual for reasons not obvious but suspicious. About two months ago we had an outbreak of scarlatina in Chesapeake City, in which instance there were a number of mild, some severe and a few fatal cases, but by prompt adoption of sanitary measures in the way of isolation, disinfectives, fumigation and cremation, it was easily averted. On another prior occasion we had an outbreak of small-pox near Perryville, where three cases occurred, but no deaths. It was also promptly arrested by adoption of similar measures as above stated, together with general vaccination. This, I should state, occurred about the first of March, prior to the three months covered by the request of our esteemed Secretary, during the month of May. We also had quite a visitation from Roseola or Scarlet Rash, commonly termed French Measles, among the school children, some of whom were quite ill, accompanied with marked elevation of temperature and throat symptoms, but soon subsided upon the appearance of the eruption. But the majority of the cases were mild, requiring simply to be housed and made comfortable, needing no medical treatment. I may also add there has been a more general and rigid enforcement of the law concerning vaccination of school children this spring than ever before, and I cannot emphasize too much the importance of its enforcement in all the counties, as we cannot know when we may have a visitation, as in the previous instance, in these days of frequent and

easy inter-communication by railroad and steamboat of strangers and residents of different and distant communities who may have come in contact with some source of contagion, not being themselves properly protected.

As to the sanitary condition of the county, I may say, this is in the main very good.

I am very truly yours,

JOHN H. JAMAR, M. D.

ROCKVILLE, July 5, 1893.

DR. JAMES A. STEUART,

Secretary State Board of Health.

DEAR SIR: The health of Montgomery county is very good at this time. During the month of April there were some obstinate cases of Grip, and also some pneumonia, but the latter did not prevail to any great extent. On the Georgetown Pike, a few miles this side of the District line, two fatal cases of diphtheria occurred, an importation from Washington, and as precautions were used, the disease did not extend beyond the one family. The month of May was remarkably healthy, a few cases of rubiola and some diarrhea, both easily controlled by appropriate remedies. June was also very healthy, some few cases of dysentery and diarrhea, but not of a very obstinate character. The sanitary condition of the county is good.

CHAS. J. MADDOX,

Sec'y Local Board Health for Montgomery Co.

CHESTERTOWN, MD., July 3, 1893.

DR. JAMES A. STEUART,

Secretary State Board of Health.

DEAR DOCTOR: Yours of June 30th, requesting a short report of the health of this section during the past three months to hand. The months of March, April and May were unusually healthy; throughout the county, as far as my information goes, there was no unusual sickness, the prevailing troubles being of a

catarrhal nature. I do not know of a season so free from serious illness. Pneumonia (of which we annually expect some cases) was marked for its absence in my own particular practice. During May, however (at least, the latter part), whooping cough and chicken-pox were quite prevalent, both being of a mild type. There has been one case of scarlet fever in this town during the time mentioned, occurring, as it did, in family of four children. The careful management and strict quarantine, as far as possible, required of the parents, together with an earnest desire on their part, prevented its spread. I have had reported to me, by a physician of the lower part of the county, two cases of diphtheria. Every effort has been made to keep it within the limits of the house where first occurring. The few warm days of June, of course, showed the effect of heat and bad sanitation upon the infants and furnished some cases of bowel troubles among the adults.

I have knowledge, so far, of only one case of typhoid fever, though there may be more, for there is certainly little disposition on the part of the general practitioners here to make this, or any other contagious or infectious disease, known to the Local Health Officer, save when he needs help or assistance for himself.

The law governing Local Boards (or County Boards) of Health is far from being as satisfactory as could be wished. The small amount of authority, and less discretion given the executive officer of such Board, makes it very hard to accomplish much.

I shall be very glad to put you in possession of such information, or in any other way report to you such cases as are brought to my information, if you so desire.

Yours very truly,

W. FRANK HINES,
Secretary Local Board of Health.

CUMBERLAND, MD., July 7, 1893.

DR. JAMES A. STEUART,

Secretary State Board of Health.

DEAR DOCTOR: I have been unwell for several days, and did not get to Baltimore.

I enclose a quarterly report of our Board of Health, and will be glad to furnish reports and give any other assistance in my power to the State Board.

Very truly yours,

E. T. DUKE.

REPORT OF THE SANITARY CONDITION OF HAGERSTOWN AND WASHINGTON COUNTY.

HAGERSTOWN, December 30, 1893.

TO JAMES A. STEUART, M. D.,

Secretary State Board of Health.

MY DEAR SIR: Hagerstown, with a population of 13,000, is situated most favorably for health, about midway, and in full view, of both the South and North Mountains, at a point at which the Cumberland Valley is 23 miles wide, and has an elevation of 565 feet above tide water. It has good and pure mountain air, which, together with other natural conditions, has led to the observation that the locality is especially adapted to female health. Besides its good natural drainage, there has been recently completed a most excellent system of drainage throughout the city, which discharges into the Antietam Creek, an active stream that skirts the southeastern borders of the corporation limits, and is rapidly conducted away.

Hagerstown is supplied by water from reservoirs located in the South Mountain, which are replenished from several large mountain springs. Very little water is now used from city wells, formerly the chief source of water supply. It has no sewerage as yet, but the city authorities have been empowered to construct a complete system, which is at present under consideration, with the expectation of soon having it

in full operation. At present much of the sewerage is run into cesspools, dug to a depth of from 10 to 12 feet, and covered over with earth. The rocky and cavernous formation of the earth at this depth, in the more elevated parts of the city, renders it well adapted to the use of such cesspools, but it is in the lower portions of the city that the great need of sewerage is evident.

Since the organization of a Local Board of Health in our county, over a year ago, an abundance of sanitary work has been accomplished. Up to the present time over 300 dangerous nuisances have been abated.

The fact of hog-pens and slaughter-houses, which constituted such a conspicuous part of our unsanitary state, and such a constant menace to the health and lives of our people, has, as to hog-pens, been largely abandoned, but it will require the co-operation of our city authorities, by ordinance, to free our city completely and permanently of such disease incubators and establish a satisfactory garbage system. But, I am sorry to state, that up to the present time this needed co-operation on the part of our city council has been withheld, for reasons which have not been explained. Our city council should be composed of men who are at least in accord with the health organization upon such grave sanitary questions as this, and not allow their individual interests, political or otherwise, to stand paramount thereto. The corporate authorities of the principal towns of Washington county have, with few exceptions, taken a more favorable view of sanitation, and invited the co-operation of the health organization to their aid, much to the improvement of their respective corporations, in a sanitary way. Typhoid fever, the only zymotic disease, so called, that has appeared to any extent, has been principally confined to rural homes. The disease presented distinct and veritable characteristics, but did not cause many deaths. The cause of the fever in each family seemed to be traceable to the drinking water, which was

generally obtained from wells. Analysis made of several samples of this water detected in every case, but one, the presence of chlorine, albumen and the nitrates. This disease appeared during the prolonged drought of last summer, when the water level was very low, and its impurities more concentrated.

Our school houses are of two kinds, the old and the new. Those more recently built are provided with ventilation flues, and other sanitary provisions. The older school buildings are deficient in these respects. It is, however, pleasing to notice that the very important matter of ventilating school rooms is more provided for than formerly. No great number of scholars can be crowded and confined within a badly ventilated room without feeling more or less lassitude, headache, loss of appetite, etc., before the day of confinement is ended. Good ventilation is a condition most favorable to mental work, to say nothing of serious consequences which may develop from its neglect. The rooms are heated mainly by coal stoves, an arrangement that has the disadvantage of making it too warm for those seated near them, while those at a distance do not, perhaps, receive sufficient heat.

The proper lighting of the rooms in the recently built school-houses has received more architectural consideration. The scholars are not seated fronting a strong, glaring light, that is still more intensified by reflection from the plain, white walls, as formerly, besides shades and blinds are employed to modify the light, as required. If this important matter were more generally observed, the result would be that fewer children would be found wearing eye-glasses, on account of eye-strain, as they are told by the physician.

The water-closets are usually in a neglected sanitary state, some of them shockingly so. They are separated from the school building, requiring exposure to all kinds of stormy weather to reach them, as well as the exposure of a part of the nude body after scholars have reached the cold and chilling places. The custom of

having but a single cup for each room is another matter for consideration. It cannot be denied that diseases are easily propagated in this way, particularly diphtheria. Every child should be provided with an individual drinking cup.

Vaccination in our schools has been generally complied with, as far as it can be judged, but a strong disinclination to submit children to this wise provision is most manifest. So much so, that if it were not that the law upon this subject provided for its enforcement, there would be an almost entire disregard of vaccination among our people. At the suggestion of our Local Health Board, each public school has been furnished, through the Board of School Commissioners, with placards of sanitary rules, to be hung in some convenient place for ready reference, which is to call the attention of teachers, trustees and scholars to the provisions of the general laws of our State, and the rules and regulations of our State Board of Health relating to vaccinations, as well as to all contagious and infectious diseases, so far as they affect public schools. This method will, no doubt, serve a most valuable purpose in instructing and reminding those in authority over the schools as to these absolute requirements, and their usual plea of ignorace of them will thereby be set aside. Would it not be well to make such sanitary placards a requirement?

The establishment of a health organization in our county has gained the favor and approval of our people. They promptly learned to understand and appreciate its importance, and are free to acknowledge the good work it is capable of performing. It may be said that it is an organization that will soon be esteemed as second to none in every county throughout the State. But to make it such, an active, firm and impartial administration should prevail.

Yours very truly,

T. W. SIMMONS, M. D.,
Health Officer.

Letter published in the Sun as a Warning against Small-pox.

In view of the fact that small-pox has again made its appearance in many parts of this country, and in some not distant places, in an epidemic form, it is therefore deemed necessary by the State Board of Health to promulgate this timely warning to the people of Maryland. There exists at this time *no* small-pox in this State, so far as is known to the State Board, but that fact does not remove the obligation of obedience to the law, or the moral obligation of protection from this loathsome disease towards the community and the family.

One tramp with small-pox, tramping through an unvaccinated community, may give rise to direful consequences.

Due notice is, therefore, given to all whom it may concern, that the following* laws will be rigidly enforced.

JAMES A. STEUART, M. D.,
Secretary and Executive Officer
Nov., 1893. *State Board of Health.*

QUARTERLY REPORTS.

First Quarterly Report of James A. Steuart, M. D., Secretary State Board of Health, Presented to the Board at the Quarterly Meeting held in Baltimore, July 6, 1893.

Since assuming the office of Secretary of the State Board of Health on the 1st day of May last, your secretary has, through correspondence with various parts of the State, had the pleasure to learn that no serious epidemic, or endemic, of disease has prevailed in any part of the State during that time.

The reports herewith presented from Dr. Billingslea, Carroll; Dr. Maddox, Montgomery; Dr. W. F. Hines,

* The quotations from State laws were published with above "Warning" in the Baltimore *Sun* and will be found in a previous portion of this report.

Kent; Dr. J. M. H. Bateman, Talbot, and Dr. J. H. Jamar, Cecil, Health Officers of the counties named, give cheering assurance that each locality is being carefully watched by vigilant and competent guardians.

The reports of the Food Inspectors, herewith presented, shows diligence and care, and I think we may assume that the constant presence of an inspector has in some degree reformed the dealers, as evidenced by the better quality of both flesh and fish offered for sale as food in our markets, bad fish and crabs, bad meats, vegetables or fruit of any kind being the rare exception, and evidently becoming more rare every year. The report of Inspector Godman, in regard to the dairy farms in Maryland, a number of which he visited at my request in the month of May, is proof of the fact that an excellent article of milk is produced by these farmers who supply the dealers in the city with this important article of diet, and that it is within the power of all retailers to supply themselves and their customers with a pure and wholesome article of milk. From the analyses recently published by the *News* (a series of some hundred samples analyzed), it is quite plain that the adulteration is the work of the small dealers who sell to the poor in very small quantities, and who, combining ignorance with dishonesty, imperil the lives of thousands of helpless little ones. There can be no question of the fact, that in the high rate of infantine mortality during the heated term, the hand of the dishonest milk dealer can be readily traced. How to prevent this is a problem most difficult of solution. Improvements in the statutes bearing upon the regulation of food and drink have been good in certain directions, but, in regard to milk, the evil will never be corrected until the law is made far more stringent than it now is, and inspectors, in sufficient number, be employed to see to it that the law is obeyed. The standard minimum adopted by the Board, some few years ago, is specific gravity 1029. Total

solids 12. The extent to which adulteration of milk is practiced in Baltimore, can readily be inferred from the fact that only ten per cent. of the samples examined, under the auspices of the *News*, measured up to or above this minimum standard, these ten samples being drawn chiefly from the dairy farmers direct, whilst 90 per cent. were from the retail dealers.

Of the 28 samples examined by Prof. Penniman at the instance of your secretary, and drawn from the dairy farms almost direct, only three were below the minimum; whilst others ranged as high as 1034 specific gravity and 15 total solids. The names of these twenty-five producers certainly deserve to be placed upon the roll of honor.

It affords me pleasure, also, to lay before you the results of the examination of the Lake Roland water supply. At all times the purity of the water used in a large city is of paramount importance, but in view of the possible invasion of cholera in this country, during the present season, it becomes doubly so. I, therefore, deemed it wise to have an examination made of all the tributaries of Lake Roland, as well as of the lake proper, and also of the waters drawn from a city hydrant. The analyses which I lay before you, together with the correspondence relating thereto, will doubtless interest as well as gratify you, notwithstanding the fact that it has, through the energy and public spirit of the *News*, already been laid before the people of Baltimore. Three samples of water were sent by Dr. Jamar from Elkton, Md., with the request that they be examined by the chemist of the Board. The result, shown by Prof. Penniman's report, is that two are excellent and the third very doubtful.

On May 27th I was called upon by Dr. Eugene Douglas, of Oxford, Md., with a letter of introduction from Dr. Bateman. Dr. Douglas stated that he was very desirous of discovering the cause of the sudden death of two members of a family residing in Oxford, and the serious illness of all the other members of the family

who had partaken of certain food. He brought with him the contents of the stomach of one of the victims, as well as a can from which preserved fruit had been taken, and he requested that the State Board of Health assist in the discovery by having an analysis made of the fluid drawn from the dead child's stomach and the tin of which the can was made.

I at once placed them in the hands of Prof. W. P. Tonry, and his report is herewith presented, together with a medical history of the cases by Dr. Douglas. They are both interesting and instructive, as showing the dangers to which the public are unwittingly exposed. This subject is still under investigation, with a view to the discovery, if possible, of the reckless manufacturer who placed upon the market a can made of so-called "tin," but which proves to be washed with lead instead of tin, the former being much the cheaper metal, and therefore, more profitable to the manufacturer.

Before closing this report I cannot refrain from an expression of my admiration for the sanitary methods of my predecessor, and for the valuable literary material he has contributed for the benefit of the public, as well as for the guidance of this Board and his successor in the office, he so highly adorned. And I would respectfully suggest that a committee be appointed, by the President of the Board, to draft a resolution expressing thanks and appreciation of his long and valuable services to the State of Maryland and to this Board.

Respectfully submitted,

JAMES A. STEUART,
Secretary State Board of Health.

Second Quarterly Report of James A. Steuart, M. D., Secretary and Executive Officer of the State Board of Health of Maryland, for the quarter ending September 30, 1893.

The record of the past three months, in regard to the general health of the State of Maryland, has been even better than that of the previous quarter, upon which the Board was congratulated at the last quarterly meeting.

Contrary to anticipation, there has been no epidemic of disease of any character whatsoever, and the general death-rate in the City of Baltimore, as well as throughout the state, as far as the secretary has been able to ascertain, has been exceptionally low. Isolated cases of typhoid fever, and a very moderate number of cases of scarlet fever and diphtheria, make up the greater part of the list of zymotic diseases that have occurred in the city and State.

The almost total absence of small-pox from the records is a gratifying evidence of the general extension of vaccination and its increasing favor and importance in the minds of the general public. Could the same convictions, in regard to the preventable character of typhoid fever, scarlet fever, diphtheria and phthisis pulmonalis, be made to penetrate and control, there would be a vast decrease in the ratio of mortality with a corresponding increase in the health, happiness and prosperity of the human race.

As it has taken a hundred years to establish the prophylactic power of vaccination, it may require as long a time, if not longer, to eradicate, through sanitary education, the whole list of preventable diseases. It is the special mission, therefore, of every physician and every enlightened person to preach the doctrine of sanitation, and not only to preach but to practice as well as an example to others.

Whilst the general condition of healthfulness has

prevailed, there are localities in the State which need reforming, and where the local governments in defiance of the recommendations of the State Board of Health, and the urgency of the Local Health Officers, still neglect or refuse to comply with such recommendations. Cumberland, strange to say, is a notable instance of this, notwithstanding the warnings of the past as well as the admonition of the present. On the 2d of August I visited Cumberland, and after a thorough inspection of the city and its surroundings, especially its sources of water supply, I addressed the accompanying communication to the mayor and city council, a copy of which is a part of this report.

BALTIMORE, August 9, 1893.

To the Honorable, the Mayor and
City Council of Cumberland, Md.

GENTLEMEN: On the 2d of this month I received by telegraph a request from Dr. W. F. Twigg (Health Officer of Allegheny County) that I should at once visit Cumberland, in order to investigate, in company with Dr. Spear and himself, the cause or causes of the very unsanitary condition of the water then being supplied to the inhabitants of your city, as well as to observe the general conditions appertaining to drainage, etc. On Thursday, August 3d, we visited the pulp-paper mill, at the West Virginia Junction, some 30 miles beyond Cumberland, and found the mill shut down, and the water of the river, both above and below the mill, perfectly clear and apparently pure.

The analyses of four specimens of water, drawn August 4th, are herewith submitted. An examination of these analyses tend to show that the fault lies much nearer home and demands correction.

This condition of affairs has existed for some years, rendering it still more surprising that so little effort has been made in all these years by the authorities of Cumberland to remedy this dangerous evil. As far

back as 1887 Dr. W. J. Craigin, County Health Officer, writing from Cumberland, says:

"The water supply in this place is probably very much polluted by our own people; at least, it is liable to be, from the following sources: A small stream or race empties into the river, about one hundred yards above the supply pipe. This stream, which is sometimes dry in summer, drains the territory occupied by one-fifth to one-fourth of the population of the city. On its banks are privies, pig-pens and stables; some privies discharge directly into it, and it receives a large amount of surface drainage. Near the head of this stream are two large cemeteries, in which most of the interments of the city are made, and the drainage from both passes directly into the stream and from thence into the river. The surface drainage from about one-fourth of the town falls directly into the river, near the supply inlet at the water works; some privy vaults are within 60 feet of this inlet-pipe. These vaults are about 18 feet deep, walled with brick and cemented. The one nearest the inlet-pipe has not been cleaned for three years. (There is no assurance that any of them are water tight.) Stables and pig-pens are also nearby. * * * It cannot be denied that we must get 'the cream of pollution' in our river supply of water."

The above statements are fully borne out by the recent analyses given herewith. "These analyses prove very conclusively that the chief source of pollution to the general water supply of Cumberland is within the city limits, and that the city is, in fact, fouling its own water supply; that the water now being supplied to the people of Cumberland is in a most filthy and unwholesome condition is beyond question or doubt, and that a pure and wholesome water is necessary for the preservation of the health of your citizens will be admitted by all." It, therefore, becomes absolutely

necessary for the city authorities of Cumberland to bestir themselves and devise some adequate means by which this threatening danger and growing evil may be averted. Situated in a basin, as it were, you are dependent upon three possible sources of water supply:

1st. From the Potomac river, which, when flowing full, is comparatively good, but still exposed to contamination from the various sources.

2d. From springs, shallow pump wells and cisterns within the city; and—

3d. From artesian wells, five or six of which are now in successful operation in your city.

The first of these, namely, the river water, can be made a safe, potable water, by filtration, before it enters the supply-pipes of the city. The second is limited in quantity as well as dangerous in quality. The third would give a copious supply of pure water if a sufficient number of such wells were bored and pumped according to the Holly system into a stand-pipe suitably situated for the purpose. You have, therefore, practically a choice between only two sources of supply, namely, the filtration of the river water and the boring of artesian wells. The experience of the City of London, England, with its nearly 6,000,000 of population, has fully demonstrated the practicability and utility of the filtration system. London derives ninety to ninety-five per cent. of all its water from the Thames, which is far more polluted than the Potomac at any point in its whole course, and yet the people of London get good water, and her death-rate is the lowest of any city of one hundred thousand population and over, in the whole world. I would, therefore, urgently recommend the immediate adoption of the filtration system, and will add that, in my opinion, as Health Officer of the State, the adoption of some plan by which a pure water supply can be insured to your people is demanded by every consideration of duty and common sense. As it is the first duty of the State to promote the public health, so likewise it is the duty of

every municipality to neglect no detail in the accomplishment of this important purpose. Permit me further to suggest that an effective way of promoting the earliest possible accomplishment of the purposes we have in view will be the selection and appointment of a committee composed of your most intelligent and trusted citizens, instructed to examine into the subject of a water supply for the City of Cumberland in all its details, and to report to the Mayor and Council at the earliest possible moment.

There are many other sanitary reforms needed in the City of Cumberland, but these come under the duties and jurisdiction of the City Board of Health, with whom the Executive Officer of the State Board will always be ready to advise and co-operate.

Very respectfully,

JAMES A. STEUART,
Secretary State Board of Health.

ABATTOIRS.

The amount of capital invested in the butchering business, by private parties carrying on business on their own account in Baltimore, is very considerable, and is, therefore, entitled to due consideration. Their number, however, is very small in comparison with the total population of a great city like Baltimore, and it becomes a question whether the vital interests, in point of health and comfort, of at least 95 per cent. of the population, should be subordinate to the remaining 5 per cent., notwithstanding their wealth and influence. It is a settled principle of law, resting upon the foundation of the Constitution of the State and the United States, that private property shall not be taken for public uses without due compensation therefor. This principle must apply when we consider the necessity of banishing the slaughtering establishments from within the corporate limits of the city. The difficulty of accomplishing this end, through argument,

has long since been found insurmountable by all the health authorities who have considered this subject in the past.

The butcher argues that his establishment is in a perfect state of excellence, that he enjoys the best of health, and that his family are seldom sick, at least not more so than the families of other people. This may be true to a certain extent, but it does not remove the fact that slaughter-houses are, if situated in towns or cities, or in close proximity to dwellings, anywhere, a nuisance *per se*, and a menace to the health and happiness of the neighborhood in which they exist.

It has long since been demonstrated that the only unobjectionable mode of conducting the slaughtering business is on the abattoir plan, and so situated as to be entirely away from all residences. How can this be accomplished? In most of the larger cities of this country, and all those in Europe, abattoirs have existed for a long time. In some cases all private slaughter-houses have been summarily removed by law, and all slaughtering confined to the abattoirs. In other cases the abattoirs have been established through private enterprise, and the butchers have gradually come into the enterprise voluntarily, and in every instance they have been obliged to admit that this method of carrying on the butchering business was more profitable to them than carrying on the same business as a private enterprise upon their own premises. Not only this; they have found it far more agreeable to themselves and their families, to say nothing of their neighbors not engaged in the same business. And still more, in neighborhoods where the price of property has been greatly depressed by the presence of slaughtering establishments, sales being limited to butchers only. The moment all vestiges of these establishments have disappeared, the value of property has gone up with a bound, and the butcher has been astonished to find himself more prosperous than he ever was before.

My first proposition cannot be successfully contro-

verted, viz., that private slaughtering establishments within the city are dangerous to health, destructive of comfort and depressing to the values of all neighboring property.

My second is equally true, that this essential trade is more profitably conducted at the abattoirs than formerly at private establishments. With these propositions granted, the question recurs, how are the private slaughtering establishments to be gotten rid of within the city? If the butcher has not sense enough to appreciate the situation, and to see, not only his own interest, but the interest of the community in which he lives, something must be done to enforce the removal by setting a time in the future, say three, or even five years, after which time it shall be unlawful to carry on the business of slaughtering animals within the city limits, except at the licensed abattoirs. Other offensive trades have, and properly should be, prohibited, and why not the butchering trade? An examination of this question will be a surprise, when the very small number of private slaughter-houses that still exist is revealed. This small number of butchers make up in noise and bold assertions what they lack in numbers, importance or justifying arguments in their favor.

The time has arrived for action in regard to this matter, and the sooner it is done the better for all concerned.

WATER SUPPLY—CITY AND STATE.

The water supply of the city and State have been special objects of the solicitude of the State Board of Health during the last nine months of the past year (1893), and many analyses have been made, the reports of which are appended to this report. The water supply of Baltimore City has received special attention, analyses having been made at frequent short intervals during the summer and autumn. These reports,

although revealing some minor defects, on the whole gave assurance of the wholesome character of the water used by the citizens of Baltimore, both the Jones Falls and Gunpowder River supplies being pronounced "good."

I am sorry to say this has not been the case with many of the rural districts of the State. It was established as a rule by your secretary that wherever typhoid fever was known to exist, to have the water used by these patients analyzed at once. This system has always resulted in good to the families of the town, village or farm, by checking the progress of the disease, and where the advice of the State Board of Health has been heeded the disease (almost invariably typhoid fever) has disappeared entirely. I deem it, therefore, of such vital importance to the health of the State that I shall ask the General Assembly for a liberal appropriation to enable the State Board to carry out its investigations of the drinking water in every section of the State. Be assured, gentlemen, that there is no more important matter that can engage your attention than the preservation of the public health, and liberality in this direction may save many a life and ward off many a prostrating illness, as well as the losses and distress which are such constant attendants upon sickness and death.

The following analyses should be very interesting to all who are interested in local and general health:

BALTIMORE, August 8, 1893.

DR. JAMES A. STEUART,

Secretary State Board of Health.

MY DEAR SIR: I hand you herewith report of analyses of Cumberland water. These samples were drawn by you on August 4th, and as you are acquainted with the "sanitary surroundings" of the sources of the various samples, I will have to ask you to fill in the reports. Sample No. 1 is in good condition and fit for use. Sample No. 2 is of doubtful quality, and if the sanitary surroundings are bad, its use is certainly inadvisable. If all the sanitary conditions are good the water cannot be unhesitatingly condemned, but can be classified under the head of *suspicious*.

Sample No. 3 is of VERY BAD quality, and in addition to the deleterious character shown in the report, contains a very large amount of iron, the amount and character of which I will investigate and report to you in a later report.

Sample No. 4. This water is of very bad quality, and all that I have said of No. 3 holds true of it.

Yours very truly,

W. B. D. PENNIMAN,

Analyst.

SAMPLE NO. 1, FROM POTOMAC ABOVE PULP PAPER MILL.

Report on Sanitary Examination of Water. Sample No. 1.—Source, Cumberland, Md. Drawn by James A. Steuart, M. D., August 4th, 1893.

PHYSICAL PROPERTIES.

Color, none. Odor, none. Reaction, neutral.

	Chemical Analyses.	Parts per 1,000,000.
(1)	Total residue on evaporation at 230° F.	100.0
(2)	Inorganic residue on ignition	91.0
(3)	Organic residue	9.0
(4)	Amount of chlorine	3.8
(5)	Amount of free ammonia	*.083
(6)	Amount of albumenoid ammonia	.135
(7)	Amount of nitrates	†Trace.
(8)	Amount of nitrites	None.

*Too high. †The word trace indicates that the substance is present, but in too small an amount to be determined.

EXPLANATION.

Good drinking water should be clear and colorless, without odor and neutral in reaction.

(1) The total residue should not exceed 500 pts. per 1,000,000.

(2) The inorganic residue may constitute the total residue.

(3) The smaller the amount of inorganic residue the better.

(4) The amount of chlorine should not exceed 6 pts. per 1,000,000.

(5) The amount of free ammonia should not exceed .05 pts. per 1,000,000.

(6) The amount of albumenoid ammonia should not exceed .15 pts. per 1,000,000.

(7) The amount of nitric acid (N_2O_5) should not exceed 5 pts. per 1,000,000.

(8) The amount of nitrous acid (N_2O_3) should not be present in sufficient quantities to estimate.

CONCLUSIONS.—This water is free from sewage contamination, and in spite of the high amount of free ammonia is in my opinion fit for use.

W. B. D. PENNIMAN,

BALTIMORE, August 8, 1893. *Chemist.*

SAMPLE NO. 2, FROM POTOMAC RIVER, BELOW PULP PAPER MILL.

Report on Sanitary Examination of Water. Sample No. 2.—Source, Cumberland. Drawn by James A. Steuart, M. D., August 4th, 1893. Remarks on sanitary surroundings.

PHYSICAL PROPERTIES.

Color, none. Odor, none. Reaction, neutral.

	Chemical Analyses.	Parts per 1,000,000.
(1)	Total residue on evaporation at 230° F.	115.0
(2)	Inorganic residue on ignition	115.0
(3)	Organic residue	.....
(4)	Amount of chlorine	*6.4
(5)	Amount of free ammonia	.03
(6)	Amount of albumenoid ammonia	.097
(7)	Amount of nitrates	†Trace.
(8)	Amount of nitrites	None.

* Too high. † The word trace indicates that the substance is present but in too small an amount to be determined.

CONCLUSIONS.—This water is of doubtful quality. I do not think its use is advisable.

W. B. D. PENNIMAN,

BALTIMORE, August 8, 1893. *Chemist.*

SAMPLE NO. 3, FROM POTOMAC, AT MOUTH OF GEORGE'S CREEK.

Report on Sanitary Examination of Water. Sample No. 3.—Source, Cumberland. Drawn by James A. Steuart, M. D., August 4th, 1893. Remarks on sanitary surroundings.

PHYSICAL PROPERTIES.

Color, none. Odor, none. Reaction, *acid.*

	Chemical Analyses.	Parts per 1,000,000.
(1)	Total residue on evaporation at 230° F.	*1698.0
(2)	Inorganic residue on ignition	*1372.0
(3)	Organic residue	* 326.0
(4)	Amount of chlorine	* 6.2
(5)	Amount of free ammonia	* .39
(6)	Amount of albumenoid ammonia	.09
(7)	Amount of nitrates	2.5
(8)	Amount of nitrites	None.

* Too high.

CONCLUSIONS.—This water is unfit for use. See letter herewith.

W. B. D. PENNIMAN,
Chemist.

BALTIMORE, August 8, 1893.

SAMPLE NO. 4, FROM CUMBERLAND WATER SUPPLY IN CITY.

Report on Sanitary Examination of Water. Sample No. 4 —Source, Cumberland. Drawn by James A. Steuart, M. D., August 4th, 1893. Remarks on sanitary surroundings.

PHYSICAL PROPERTIES.

Color, yellow. Odor, none. Reaction, neutral.

	Chemical Analyses.	Parts per 1,000,000.
(1)	Total residue on evaporation at 230° F	*588 0
(2)	Inorganic residue on ignition	*364.0
(3)	Organic residue	*224.0
(4)	Amount of chlorine	.....
(5)	Amount of free ammonia	.03
(6)	Amount of albumenoid ammonia	.113
(7)	Amount of nitrates	*5 69
(8)	Amount of nitrites	None

* Too high.

CONCLUSIONS.—This water is unfit for use. See letter herewith.

W. B. D. PENNIMAN,
Chemist.

BALTIMORE, August 8, 1893.

In other parts of the State, notably Hagerstown and Frederick City, active measures have been taken by the local health officers, acting under the authority of the State Board, to abate several dangerous nuisances, with very satisfactory results.

In August I visited Hagerstown at the invitation of the county health officer, Dr. Simmons, in regard to the water supply of the town and other local conditions requiring immediate attention. An analysis of the Hagerstown water supply was made by Professor Penniman, and pronounced healthful in all respects, thus removing from the minds of the citizens of the town a great anxiety. The orders issued by the local health officer, backed by the authority of the Board, for the abatement of several nuisances, were promptly obeyed. At Frederick, the health officer, Dr. W. H. Baltzell, has been obliged to bring suit in the name of the State Board to enforce obedience. These suits are still pending in the county courts.

The importance of keeping a watchful eye upon the condition of the water supply of Baltimore City justified, in the opinion of your Secretary, a thorough examination of the water of all the tributary streams supplying Lake Roland, as well as an examination of all the water-sheds contributing to them. Whilst a number of sources of possible danger of pollution were discovered, the report on the general condition of the water of the lake itself, as well as upon some samples drawn from the hydrants of the city, was most favorable. The report made by me to the Mayor of Baltimore is as follows :

BALTIMORE, June 8, 1893.

HON. F. C. LATROBE,

Mayor and President of the Water Board.

DEAR SIR: I have the honor to hand you herewith a supplemental report made by Prof. W. B. D. Penniman, in regard to the water of Lake Roland. It is very gratifying to me to find that this portion, at least, of the drinking water of the city, is in such

excellent condition. In fact, quite as good, if not better, than that of any other city in this country. My intention is to follow up these examinations in regard to Loch Raven water supply, and also to continue analysing in various parts of the city, from time to time, during the heated term.

Very truly yours,

JAMES A. STEUART,
Secretary State Board of Health.

Again, in July, I ordered an analysis of the city water, including the supply from the Gunpowder River. The report was again favorable.

A third analysis was ordered on the 10th September and is to be found further on in this report.

On July 17th I was summoned, by telegraph, to Easton, on account of an alleged case of yellow fever in that vicinity. I responded at once, and the following letter in reply to a telegram for Dr. Wyman, Surgeon Gen'l M. H. service, will explain.

BALTIMORE, July 22, 1893.

WALTER WYMAN, M. D.,
Supervising Surgeon General
Marine Hospital Service, Washington, D. C.

SIR: Yours of the 21st received to-day, and, as requested, wired you that I would explain by letter July 17th, at 1 o'clock P. M., I received the following dispatch:

"EASTON, TALBOT COUNTY, MD., July 17.

"A young man died here this morning. The physician reported to me yellow fever. Please come this evening by 3.30 train. Important. Answer. Signed, J. M. H. Bateman."

As Dr. Bateman is a member of the State Board of Health, I responded at once and reached Easton at 7 o'clock that evening. Dr. Bateman drove me at once to the residence of Judge Bartlett, about one mile from

the village. There I met Dr. Dunning, the attending physician, who had made the diagnosis of yellow fever. I got from him substantially the following history of the case.

Mr. Bartlett, aged 26 years, traveling salesman for a Baltimore shoe house, had been on his tour through the southern states, traveling some weeks previous to his being taken sick, on or about the 24th or 25th of June. The doctor he consulted in Mobile, Alabama, advised his immediate return to his home, as he thought he was "going to be very sick." This he did, and arrived by sea in Baltimore about the 28th of June, and proceeded at once to his father's house, one mile from Easton. He went at once to bed and sent for Dr. Dunning. No diagnosis was given out until after or *just before* death.

Upon closely questioning the attending physician, I learned that his patient's temperature had risen as high as 105° F., but fluctuated from day to day, and sometimes from hour to hour, from two to four degrees. There was no vomiting or nausea, and all food was retained and apparently digested. There was no suppression of urinary secretion and very slight trace of albumen, and no marked disturbance of the bowels. No discoloration of the skin, or even of the sclerotica. The post-mortem appearances were not marked by anything justifying the diagnosis. As the family objected to a post-mortem examination, it was not insisted upon, particularly as I had not the least hesitation in pronouncing it a case of high-grade bilious remittent fever, such as was very common fifty years ago both on the Eastern and Western Shores of the Chesapeake Bay, but which, happily, is now very rarely seen. I must add, in extenuation of the young doctor's rash diagnosis, that he had never seen a case of yellow fever, and had had only one year's experience in the practice of medicine in a very healthy district.

As to the statement that Mr. Bartlett had been to

Brunswick I am unable to say,* but I do know that the published statement that he had been to Cuba is not true. Very respectfully,

JAMES A. STEUART, M. D.,
Secretary State Board of Health.

In accordance with the resolution offered by Dr. John H. Jamar, seconded by Dr. John Morris (as suggested in the last report of the present secretary), I have prepared and transmitted to Dr. C. W. Chancellor, at Havre, France, the following resolutions:

Extract from Minutes of Quarterly Meeting held July 6, 1893.

At a meeting of the State Board of Health, held in the city of Baltimore on the 6th day of July, 1893, it was unanimously resolved, upon the motion of Dr. John H. Jamar, that the Secretary be requested to convey to Dr. C. W. Chancellor, late Secretary of the State Board of Health, their high sense of esteem and regard as well as their appreciation of the long and valuable services rendered by him to the State Board of Health and to the State of Maryland:

Resolved, That the foundations laid by Dr. Chancellor, upon which rests the usefulness of the State Board, attest the zeal and wisdom which have animated and guided him from the beginning of his connection with the Board and its establishment in the State of Maryland.

Resolved, That the best wishes of each member of this Board attend upon Dr. Chancellor's future career, with the confident expectation that he will become as distinguished in his new calling as he has been in the past as a health officer and sanitarian, and we tender him our warmest wishes for his future health, happiness and success.

Your Secretary would also call your attention to the following circular, and request authority to comply, as

* Since the above it has been positively stated that he was not at Brunswick, Ga.

was done last year, according to agreement, to contribute annually $10 for the purposes named in said circular.

JAMES A. STEUART, M. D.,
Secretary and Executive Officer.

NATIONAL CONFERENCE OF STATE BOARDS OF HEALTH.
SECRETARY'S OFFICE. COLUMBUS, OHIO,
September 18, 1893.

DEAR SIR: At the last meeting of the Conference, held in New York City, in April, 1893, it was voted to print the proceedings of the Conference, and assess the various State and Provincial Boards of Health for the cost thereof. It was further voted to solicit a subscription of $30.00 from each State and Provincial Board to defray the expenses of the Quarantine Commission appointed by the Conference, whose report will be printed in the proceedings of the New York meeting.

The regular annual membership dues are $10.00 for each State and Provincial Board of Health, and if each Board will send this amount to the treasurer, Dr. Henry B. Baker, Lansing, Michigan, it will not be necessary to make a special assessment to pay for printing the proceedings.

If you have not attended to this, please send dues at once, as the expenses of members of the Quarantine Commission have not yet been paid. Your subscription of $30.00, if intended to be made, should also be sent in as soon as possible.

A communication was sent you some weeks ago in regard to securing reprints of the proceedings of the last meeting.

As it will be impossible to hold forms until the entire proceedings are in type, you will please send an order at once for such number of reprints as you desire. Send the order direct to Pfeifer & Saas, Publishers, 271 South High Street, Columbus, Ohio.

Respectfully,
C. O. PROBST, M. D.,
Secretary.

Third Quarterly Report of the Secretary State Board of Health, for the Quarter ending Dec. 30, 1893.

The past quarter has been marked by unusal interest in the work of your secretary, and I trust with benefit, as far as it has gone, to the State at large. In the month of October it occurred to me that the influence of the State Board of Health might be greatly increased and extended by bringing the State Board, through its executive officers, into closer relation to the County Boards of Health and County Health Officers throughout the State, and that personal intercommunication would be far more effective than was possible through correspondence only. I, therefore, determined to visit the Boards of County Commissioners in each county of the State, and on October 24th addressed the following letter to each of the Boards of County Commissioners in each county of the State. (Letter.) (See page 10.)

On the 26th I received the first reply to this letter from E. L. Eden, clerk to the County Commissioners of Frederick county, sitting at Frederick City, appointing November 8th as the day upon which the county board would receive me. On that day I proceeded to Frederick City, arriving in the forenoon, and at once called upon Dr. Wm. H. Baltzell, the local health officer and secretary of the board, sitting as a county board of health.

I was received by him, as also by the County Commissioners, with the utmost cordiality, and listened to with profound respect by all present, including the State's attorney and other citizens of Frederick, who had gathered to attend the meeting. Subjects germane to the occasion were freely discussed in the most friendly spirit, and all my suggestions were adopted by the board and ordered to be carried out, notably, the enforcement of the Vaccine Law and the isolation of contagious diseases throughout the county.

My next reply came from T. Waters Russell, Esq., clerk to the County Commissioners of Kent county, informing me that the board would be pleased to receive me on November 15th. I went by boat to Chestertown on the 14th, and made my first call after arrival upon Dr. W. F. Hines, County Health Officer, etc. He was very cordial and expressed in the warmest terms his appreciation of the visit I was making to his county.

The next day the Board of County Commissioners were equally polite, and the meeting proved most interesting. Eight physicians from the towns and surrounding neighborhood, and even from the adjoining counties, were present and took an active part in the discussions. This meeting lasted two hours and resulted in the issuance of important orders by the board, in accord with the suggestions of your Secretary, as well as the local health officer, and one or two of the medical gentlemen present.

My next reply was from Dr. C. J. Maddox, County Health Officer and Secretary to the Board of County Commissioners of Montgomery county, sitting as a board of health, and appointing November 18th as the date of meeting. I was received again by both the board and Dr. Maddox with the same manifestations of respect and interest as shown to me at other places. Quite a large gathering of physicians and other citizens filled the large room in the court house in which the meeting took place.

The president of the board expressed his gratification at this meeting, and gave assurance that the county board of health, through the activity and zeal of their worthy secretary and health officer, would put forth every effort to carry out the health laws of the State. A member of the board moved that a vote of thanks be tendered the secretary of the State Board of Health for his visit and address, which when passed was suitably responded to by your secretary.

My next reply was from Wm. Reddin, Esq., clerk to the

County Commisssioners of Talbot county, appointing November 21st for the meeting at Easton. I journeyed to Easton on the 20th in order to be in time for the meeting the next day. I was, of course, warmly greeted by our friend and colleague, Dr. J. M. H. Bateman, secretary and county health officer.

On the following day, when appearing before the board, I found myself, to my surprise, amidst a group of old friends. The president of the board, Mr. McDaniel (formerly of McDaniel & Leamy, druggists, on Charles street, Baltimore), expressed the pleasure of the board at my visit, as well as their warm interest in its object.

Among those present were Dr. Chamberlain, one of my old classmates at the University of Maryland, Dr. Hardcastle and Colonel Ed. Lloyd, late President of the State Senate. I was listened to with marked attention. The extraordinary healthfulness of Talbot county was fully commented on, and of the number of physicians present, all agreed that it was "distressingly healthy" in that section of the State. Nevertheless, my admonitions, not to be overconfident, were well received, and assurance given of a hearty cooperation in the purposes and efforts of the State Board of Health. My next appointment was at Ellicott City, Howard county, on November 23d. Dr. Owens, secretary and health officer, as well as several practitioners of medicine from the neighborhood, were present and took part in the proceedings. The most important features of the State laws pertaining to health were dwelt upon and explained by your Secretary, and he was pleased to find so responsive an audience in the County Board of Health. All of his suggestions were adopted and ordered to be promulgated by the Secretary of the Board. The letter from Wicomico county, after the appointment of a date, was withdrawn, owing to the change in the county commissioners.

My next visit was to Elkton, Cecil county, December 5th having been named by the County Commissioners

of that county. There I was warmly received (notwithstanding the prevalence of a snow storm at the time of my arrival) by our esteemed colleague, Dr. John H. Jamar, who is also Health Officer and Secretary to the County Board of Health. There were several medical men of the town present, as well as some from a distance. All manifested a lively interest in the object of my visit and entered generally into the spirit of the occasion. The report of Dr. Jamar, a repetition of which is included in the biennial report, was most satisfactory as showing activity and attention to the State laws as well as to the rules of the State Board of Health, all resulting in a diminished sick list and death rate, and emphasizing the value of good sanitary work.

From Elkton I went at once to Centreville, Queen Anne's county, an appointment for the 6th having been accepted some weeks previously. Dr. Jas. Bordley, the genial Health Officer of Queen Anne's county, met me at the station, drove me to his own house and claimed me as his guest during my stay in Centreville. This I gladly accepted, knowing full well from experience the excellence and heartiness of old-fashioned Eastern Shore hospitality.

The meeting held at the Court House, the following day, proved most agreeable and interesting. It was opened by Dr. Bordley, who read his quarterly report as secretary of the county board, which, together with a general report by him, are included in the State Board's report to the General Assembly.

The remarks of your secretary were attentively listened to, and all of his suggestions at once adopted. The influence of personal intercourse could not have been more satisfactorily illustrated than it was at this meeting. The County Commissioners warmly expressed their interest in the work of the State Board, as well as their full understanding of the duties and obligations resting upon them as a County Board of Health.

My next visit was to Hagerstown, by appointment, on December 19th. Not knowing the hour at which

the county commissioners would sit, I went on the 18th, arriving late in the evening. The next day I had a most cordial and satisfactory meeting with Dr. T. W. Simmons, the health officer of Washington county and Secretary of the Board. This meeting was held, as at other places, in the county court house, and was attended by half a dozen local and nearby medical practitioners, as well as by the town authorities and a large number of citizens, including General H. K. Douglass, counsel of the Board of County Commissioners. The address of your Secretary was given the most respectful attention, and I feel sure that much good will result from the awakened interest manifested by the men of all classes who were present. I expressed but one regret, and that was at the absence of the women of town and county, remarking that after all it is to the woman of the family that we must look for the best sanitary work of the home and its surroundings; educate her and you have won the victory.

My last visit was on January 4th, of this year, to Oakland, Garrett county, and though not in the work of the past quarter, I mention it as a part of the work done since my last report. It was a long and tiresome journey, but I felt fully repaid when I found three entirely new County Commissioners, in almost absolute ignorance even of the fact that they were ex-officio a County Board of Health, and yet eager and anxious to be instructed. My address to them was confined therefore, chiefly to reading to them such extracts from the health laws of the State as bear upon their duties as a board of health, and endeavoring to impress upon them the importance of prompt and vigorous measures in order to carry out the requirements of the law. Their responsive assurances of interest were most encouraging.

The health officer, Dr. McComas, was not present, being detained away by professional engagements.

It is a matter of profound regret to your Secretary

that out of the twenty-two letters addressed as stated above, only twelve responses have been received and only nine appointments made out of this whole number. Whether this be due to indifference or ignorance I am unable to say, but the most natural conclusion is that the remaining ten counties of the State not heard from stand sadly in need of sanitary education, and your Secretary does not intend to abandon the effort to accomplish this end. I shall endeavor, through the representatives from these counties, to reach the boards of County Commissioners, and in some way open communication with them later in this year.

The general reports received from the County Health Officers of the counties responding to my letter give a very cheering assurance of the continuance of general good health in their counties, and as but few reports of any local endemics have reached me, we may fairly conclude that the general health of the State has been, on the whole, good.

The reports of small-pox in various neighboring States has justified the publication in the Baltimore *Sun* and *American* the following warning [see page 48], accompanied by a quotation of the law bearing upon vaccination. This has been strongly dwelt upon in all my visitations, and it may, I think, be assumed that more attention has been, and is being paid to this important matter than would otherwise have been.

In addition to the above your Secretary has to report a visit to Uniontown, Carroll county, at the solicitation of Drs. Kemp, Shreve and Weaver of that place.

I made a thorough investigation of this place, and expressed my belief from the surroundings, as well as from the very defective domestic drainage, that the drinking water would reveal, upon analyses, the cause of all the cases of typhoid fever at this place. Samples of water were procured from six principal pump wells and placed in the hands of Professor W. B. D. Penniman, Analyst to the State Board. He reported every sample polluted by both vegetable and animal waste.

Acting upon the advice of your Secretary, all these wells were thoroughly cleaned, and all drainage improved. These measures at once put a stop to the disease, and gave great satisfaction to every one concerned.

FINANCIAL STATEMENT FOR QUARTER ENDING DECEMBER 31, 1893;

As per vouchers filed with Comptroller of Treasury.

Dec. 30.	Salary for October, November and December.....	$450 00
Oct. 17.	Amount appropriated vital statistics in 1893....	200 00
Dec. 30.	Amount of warrants drawn upon Comptroller for salaries and expenses of Inspectors and Analyst on Food and Drink appropriation.....	981 55
Dec. 30.	For general expenses, traveling, postage. stationery, printing, etc.....	242 61
		$1,874 16

I herewith present the above as my financial statement for the quarter ending December 31, 1893, of amounts received and disbursed by me during the past quarter. Very respectfully submitted,

JAMES A. STEUART.
Secretary and Executive Officer.

INSPECTION OF CATONSVILLE WATER WORKS.

BALTIMORE, January 9, 1893.

Catonsville is supplied by a company which furnishes water from three (3) sources, according to the demand.

SUPPLY NO. 1. The principal source. This is a small pond known as House's dam. This pond or reservoir is southwest of Catonsville proper, and about a mile and a half from the B. and P. R. R. depot. It is much lower than Catonsville, but a ridge intervenes between it and the village. This reservoir is elliptical, and is about two hundred feet long and sixty feet broad. The water is pumped from this reservoir to the tanks or receivers in the village by a pump which is situated about three hnndred yards to the northeast

of it. In this pump-house is a filter designed to filter three hundred gallons per minute. It is composed of fine sand and gravel; but is only used after a rain, when the water is muddy.

SURROUNDINGS OF HOUSE'S DAM.

The Misses Reeds' property lies to the south of House's dam. The house is about one hundred yards from the reservoir, and about thirty feet above it, but it is situated on the crest of the hill, and all the surface drainage of the house and surroundings flow away from the dam. There is a large chicken-house connected with this house, but its drainage is away from the dam. There is no cess-pool or pit on this property.

On the west side of House's dam is a swamp of considerable extent. This swamp is formed by the water over and above that which is drawn from the stream into the reservoir. This swamp could be properly drained by cutting a ditch from a drain pipe that passes under the southern end of the reservoir to the point where the water is drawn into the reservoir.

On the north side of the reservoir is a barren hill, and on the east a steep declivity.

There is but one source of supply to House's dam, and that is a stream which flows in a northern direction and crosses the Frederick road about twenty-five yards east of Rolling road.

About a quarter of a mile above House's dam this stream receives all the drainage from a barn, cow house, chicken house and barn yard of the Fernandis property, which is on the east side of the stream, the house being about eighty yards from it. There is a ditch leading from this property to the stream, which must receive all the filthy water from around the stable after a heavy rain. Twenty-five (25) yards above this ditch there seems to be an old trash pile, where old tin cans and shoes, etc., are thrown. Above this, about one hundred yards, the stream divides, a small branch

bending slightly to the east. This eastern branch receives the drainage of the Frederick road at the point of its crossing. The larger branch, just after the division, enters the cow pasture of Mr. Jones; here there is a small swamp, literally covered with cow manure, which drains into the stream. The stream at this point also receives the drainage from a barn yard, which is about sixty yards from it and about thirty feet above it. There is a drain pipe which leads directly from the barn yard down the hill to within twenty yards of the stream, and the drainage of the house and privy on the Jones' property is towards the stream. The surroundings of the stream at this point are very bad. At the crossing of the Frederick road a considerable amount of human excreta was seen on the banks of the stream. North of the Frederick road this stream receives all the drainage from the houses facing on the east side of Rolling road, about ten in number; none of these houses have cess-pools.

Supply No. 2. Reservoir near Union dam, on the Patapsco. This reservoir is situated about three and a-half miles from Catonsville, and about three hundred yards from the Patapsco river. It is fed by two small streams, which rise and flow through uninhabited country. This reservoir appeared to be in excellent condition; the water was beautifully clear. This supply is only used when the demand cannot be met by the House's dam supply.

Connected with this supply is a pipe which runs into the Patapsco, just below Union dam. This is not in use at present, and is, I believe, only used when all other supplies fail, as they did last summer.

I was unable to see the pumping arrangements of this (No. 2) supply, as it was not in use; but was told they had a filter of charcoal for the river water.

Supply No. 3. The artesian wells. There are three artesian wells—one at the main pumping station in Catonsville, one at the tanks, and the third on Mr. Cones' property. They do not use the wells, I am told,

as long as they can get water from the House's dam supply.

I have no hesitation in saying that the House's dam supply is very badly contaminated, and I think that the supply at Union dam should be used in its stead, as there seems to be no chance of pollution to its water. The Patapsco river should, under no circumstances, be used for drinking purposes, as it is unquestionably contaminated.

ARTHUR LEE BROWNE,
Inspector.

BALTIMORE, January 10, 1893.

DR. JAMES A. STEUART,

Secretary State Board of Health, Baltimore, Md.

MY DEAR SIR: Attached please find report of Mr. A. L. Browne who has made a sanitary inspection of the water-shed from which Catonsville draws its supply of water, and analyses of samples taken by him.

I have also included in the tabulation the analysis reported to you on January 6th.

There seems to be a very considerable misconception in the minds of the persons using the water supplied to them by The Catonsville Water Co. as to the source of the supply, and the treatment to which the water is subjected.

Originally, the purpose of the Company was to supply their customers with artesian well water, and in fact, it seems probable that they did so for a time. The demands on the supply became so great, however (and there may be other reasons), that the artesian well water was not sufficient to meet their needs. The supply was then increased by drawing on House's dam, the location of which, and the country drained by the stream which feeds it, is shown on the map sent herewith.

The condition of the water shed supplying House's dam has been reported to you by Inspector Browne, and it is evident that a condition of affairs exists which

is not very satisfactory from a sanitary standpoint. This condition of affairs must become worse as the country becomes more thickly settled, and in the warm season when decomposition is more active is probably much worse than at this season of the year.

I have estimated the water shed, drained by this source of supply, to be about three quarters ($\frac{3}{4}$) of a square mile. It is evident that no process of self-purification of the stream can be relied upon in this short distance, and that any source of contamination in such a small area must bear a very large proportion to the total amount of water supplied, being, therefore, relatively much more important than when found on a larger water shed.

On an examination comparatively of the analyses you will perceive that the composition of the water is very variable. Comparing, for instance, the waters drawn January 3d, analyzed and reported January 6th. The waters drawn January 3d are cloudy, and contain a very much larger amount of "total solids." Those drawn direct from the stream on January 8th are clear and show very much less evidence of contamination. On the same day, however, the water in the dam contains a larger amount of impurity than the stream supplying it. On the same day the water *above the sources of contamination* is very much purer than the sample taken from the same stream *below the sources of contamination.*

From a comparison of these analyses I then conclude—

1. That the water at all times is more or less contaminated.

2. That after a rain the contamination is much increased by washing out the various deposits of manure, etc.

3. That House's dam acts in a measure as a collector of impure water and sedimentary filth, and is not a reservoir in the sense that it allows the water to settle and purify itself by standing.

The filter at the water works is only used when the water is muddy, to remove sediment.

There are two other sources from which the company draws its supply. That from the small stream and dam near House's dam is excellent. I cannot speak of the water drawn from the Patapsco, as I know nothing of its history. Yours very truly,

W. B. D. PENNIMAN,
Analyst State Board of Health.

ANALYSES OF WATER SUPPLIED TO CATONSVILLE, MD., BY THE WATER COMPANY.

Figures in "Parts per million."

SOURCE.	Supply pipe at House's dam, Jan'y 8, 1894.	In flow at House's dam, Jan'y 8, 1894.	Supply stream to House's dam crossing Frederick road, Jan'y 8, 1894.	Water from residence of Wm. Schirensburg, Jan. 8, 1894.	Water from Miss Carter's school, Jan'y 3, 1894.	Water from residence on Newburg ave., Jan'y 3, 1894.	Water from Patapsco, at Union dam, Jan'y 8, 1894.	Water from dam near Union dam, Jan'y 8, 1894.
Color	none	none	none	none	cloudy	cloudy	clear	clear
Odor	none	none	none	none	none	none	none	none
Reaction	neutral	neutral	neutral	neutral	neutral	neutral	neutral	neutral
Total solids, 230° F	66.	68.	66.	59.	96.	99.	53.	108.
Solids on ignition	30.	38.	36.	26.	67.	73.	18.	62.
Volatile solids	36.	30.	30.	33.	29.	26.	35.	46.
Chlorine	4.5	3.7	3.	4.	4 1	4 1	3.25	3.8
Free ammonia	.008	.024	.012	.037	none	none	.037	.006
Albumenoid ammonia	.167	.074	.049	.09	.176	.109	.135	.074
Nitrates	.65	.40	.45	.30	.65	.65	.35	trace
Nitrites	none	none	none	none	none	none	none	none
Condition	suspicious	suspicious	suspicious	suspicious	suspicious	suspicious	doubtful	good

W. B. D. PENNIMAN,
Analyst State Board of Health.

BALTIMORE, January 6, 1894.

DR. JAMES A. STEUART,

Secretary State Board of Health, Baltimore.

MY DEAR SIR: Attached please find analysis of some of the water drawn from the public wells at Catonsville. These samples were forwarded by William E. Wysham, M. D., sanitary officer, January 3d, 1894. The results show that in some instances, at least, the sanitary condition of the wells is very bad, and the water unfit for drinking purposes.

Yours very truly,

W. B. D. PENNIMAN,
Analyst.

ANALYSES OF WATER FROM PUBLIC WELLS AT CATONSVILLE, MD.

Figures in "parts per million."

CONSTITUENTS.	Pump, Frederick road and Ingleside ave.	Pump, Newbury ave.	Pump, near Paradise,
Color	none	none	none
Odor	none	none	none
Reaction	neutral	neutral	neutral
Total residue 230° F	259.	114.	97.
Residue after ignition	104.	76.	73.
Volatile residue	55.	38.	24.
Amount of chlorine	94.6	20.9	6.7
Amount of nitrogen as free ammonia	none	trace	none
Amount of nitrogen as albumenoid ammonia	.051	.042	trace
Amount of nitrogen as nitrates	11.63	4.6	2.1
Amount of nitrogen as nitrites	none	none	none
Condition of water	bad	bad	good

NOTE.—The word trace indicates that the substance is present, but in too small an amount to be determined.

CONCLUSIONS.—These analyses show that the wells in the crowded part of the town are in some cases badly contaminated and should be closed.

W. B. D. PENNIMAN,
Chemist.

BALTIMORE, January 6, 1894.

BALTIMORE, January 6, 1894.

DR. JAMES A. STEUART,

Secretary State Board of Health, Baltimore.

MY DEAR SIR: Attached please find analyses of water supplied to Catonsville, Md. Two samples were taken, one from Miss Carter's school, on account of the cases of diphtheria lately occurring there, and the other from a tap in the upper part of the town. This was done in case that if the supply were by any possibility (which is imaginable) contaminated by a break in the mains.

The results of the analyses correspond, except in the amount of albumenoid ammonia, which is probably caused by the water drawn at Miss Carter's school containing a small quantity of sediment.

The general result of both analyses seem to indicate that the general water supply may be contaminated by organic matter of vegetable origin. I would respectfully recommend that an inspection be made. The water, when received, is cloudy, showing that it is filtered very imperfectly, if at all.

The samples were forwarded and drawn as per your order by William E. Wysham, M. D., Local Health Officer.

Yours very truly,

W. B. D. PENNIMAN,

Analyst.

ANALYSES OF WATER SUPPLIED BY THE CATONSVILLE WATER CO.

Figures in "parts per million."

CONSTITUENTS.	Drawn from tap Miss Carter's school.	Drawn from residence Newberry avenue.
Color	cloudy	cloudy
Odor	none	none
Reaction	neutral	neutral
Total residue at 220° F	96.	99.
Residue after ignition	67.	73.
Volatile residue	29.	26.
Amount of chlorine	4.1	4.1
Amount of free ammonia	none	none
Amount of albumenoid ammonia	.176	.109
Amount of nitrogen as nitrates	.65	.65
Amount of nitrogen as nitrites	none	none
Condition of water	suspicious	suspicious

Samples drawn by Wm. E. Wysham, M. D., January 3, 1894.

All these defects can and will be rectified, and there is no reason why the public water-supply of Catonsville should not be freed from all objectionable features.

The president of the water board, Mr. Cone, assures me that this will very shortly be accomplished.

The pumps should all be condemned and closed.

BALTIMORE, January 6, 1894.

DR. JAMES A. STEUART,

Secretary State Board of Health, Baltimore.

MY DEAR SIR: I attach analysis of the water supplied to Baltimore city. The figures show the waters to be in fair condition.

Yours very truly,

W. B. D. PENNIMAN,

Analyst.

ANALYSES OF WATER SUPPLIED TO BALTIMORE CITY.

Parts per million (1,000,000).

CONSTITUENTS.	Loch Raven supply.	Lake Roland supply.
Color	none	none
Odor	none	none
Reaction	neutral	neutral
Total residue 230° F.	89.	87.
Ignited residue	66.	69.
Volatile residue	23.	18.
Amount of chlorine	2.7	4.1
Amount of nitrogen as ammonia	.059	.026
Amount of nitrogen as albumenoid ammonia	.123	.108
Amount of nitrogen as nitrates	.8	1.15
Amount of nitrogen as nitrites	none	none
Condition of supply	fair	fair

BALTIMORE, December 12, 1893.

PROFESSOR PENNIMAN.

DEAR SIR: My wife has had a very severe attack of typhoid fever, and the doctors thought she would die, and they advised me to have the water on my premises analyzed. My residence is at Mount Airy, Carroll county, Maryland. I have an artesian well 110 feet deep, the water of which smells so bad when heated that we have not used it for three months. Dr. Steuart gave me your address, and said you would analyze it free of charge, and write me in regard to it.

Yours very respectfully,

A. N. MOUNT.

P. S. Anything else you wish to know in regard to the matter, please write me.

BALTIMORE, December 18, 1893.

DR. JAMES A. STEUART,

Secretary State Board of Health,

1611 *John Street, Baltimore, Md.*

MY DEAR SIR: I enclose analyses of Mount Airy waters, and also the sanitary report to you of Mr. A.

L. Browne, Inspector. The analysis of water from Mr. Mount's well, taken by itself, leaves us in some doubt as to the sanitary condition of the water. As you will note the amount of free ammonia is larger than our limits regard as safe, but in other ways the water is in good condition, excepting that it contains a small quantity of nitrites. Taken in connection, however, with the analysis of water from Mr. Mullinix's well (No. 2), and comparing the two, we very readily see that there is good reason for considering its condition at least suspicious if not bad.

From Mr. Browne's report we obtain the information that one case of typhoid fever occurred in the family using this water, so that he obtained a sample of water from a neighboring well of undeniable purity. We find on comparing the two waters (analyses Nos. 1 and 2), that the amount of inorganic solids is the same, but that the amount of organic solids in the suspected well is very much greater. As the amount of chlorine and ammonia is also increased, it seems probable (though not certain) that the well of Mr. Mount is contaminated by sewage at some distance, the solid portion of which is removed by percolation through the soil.

The waters from the residence and lumber yard of Mr. Molesworth are in bad condition.

Yours very truly,

W. B. D. PENNIMAN,

Analyst.

MOUNT AIRY WATERS—Figures in parts "per million."

SAMPLE FROM	1 Residence of A. N. Mount	2 Residence of Mr. Mullinix	3 Residence of E. M. Molesworth.	4 Lumber Yard of E. M. Molesworth.
Color	none.	none.	muddy.	none.
Odor	none.	none.	bad.	none.
Reaction	neutral.	neutral.	neutral.	neutral.
Total residue	30.	13.	106.	182.
Inorganic residue	12.	10.	46.	129.
Organic residue	18.	3.	60.	53.
Amt. of Chlorine	2.5	1.8	5.8	17.
" Free ammonia	.066	trace.	.1140	trace.
" Albu. ammonia	.045	.045	.0705	.0495
" Nitrates	trace.	trace.	.75	1.25
" Nitrites	trace.	trace.	.147	trace.
Condition	suspicious.	good.	bad.	bad.

W. B. D. PENNIMAN,
Analyst.

BALTIMORE, December 18, 1893.

DR. JAMES A. STEUART,
Secretary State Board of Health, Baltimore.

MY DEAR SIR: Please find enclosed my report on the sanitary condition of the "suspected wells at Mt. Airy, Md."

Yours truly,

ARTHUR LEE BROWNE,
Inspector State Board of Health.

INSPECTION OF SUSPECTED WELLS AT MT. AIRY, CARROLL COUNTY, MARYLAND.

BALTIMORE, December 15, 1893.

Well at residence of Mr. A. N. Mount, Mount Airy, Carroll county:

ANALYSIS No. 1. The house is situated on a hill and is about the highest point in Mt. Airy, the ground sloping away on all sides.

The well (artesian) is but three yards from the house, and is said to be one hundred and ten feet deep. There

is a chicken house fifteen yards from this well. The nearest privy is forty yards away, and several feet below the level of the top of the well. The surroundings (platform, drain for waste water, etc.) are in excellent condition, and I could see no chance for contamination from surface drainage.

The people who formerly used this water informed me that it had a very disagreeable odor during the summer, but that now they considered the water perfectly pure.

There has been one case of typhoid amongst the people who used this water.

Well at residence of Jason Mullinix, Mt. Airy:

Analysis No. 2. This well is on the same hill as that on Mr. Mount's property, and the water was taken for analysis as it is now used by the Mount family, and also because of its proximity to the suspected well.

The well is situated in a wing of the house, or, in other words, is almost directly under the house. There is no privy near the well, but a stable stands on the side of the hill, about thirty yards from it. The surroundings of the well are very good, platform in good condition, and apparently no chance for waste water to flow into the well. This is also an artesian well.

Well at residence of Mr. E. M. Molesworth, Mt. Airy:

Analysis No. 3.—This is an artesian well, sixty-two feet deep, and is very much above the level of the surrounding country.

It is situated at the kitchen door, and is under the roof of the house. There is a chicken house and yard twenty yards from the well, slightly above it, but the well is amply protected from surface drainage. The privy is about twenty-five yards from the well, on the same level as the chicken house.

Well at E. M. Molesworth's lumber yard, Mt. Airy:

Analysis No. 4. This is a public well. It is a dug well, and is only thirteen feet deep, is in the lowest part of the town, and its surroundings are very bad. There are two houses about four yards from this well, slightly above it, also a privy about twelve yards from the well and fifteen feet above it. This well is but a few yards from the railroad tracks and several feet below their level. This well is used almost exclusively for supplying water to the boiler of the saw-mill, but is drank by many people, especially railroad hands and the men working in the lumber yard.

As one of the mill hands had typhoid fever at the same time as Mr. Molesworth, the probability is they both contracted it from drinking this water.

There has been quite an epidemic of typhoid in this section of the country, but the majority of the cases were not in Mount Airy proper, but in the neighborhood, within a radius of eight miles.

There was a death this morning from typhoid, but the physician, Dr. Gaver, tells me the disease was contracted elsewhere, and the victim being a traveling salesman, came home sick.

I could find no visible source of contamination to the drinking waters of Mount Airy. All the privies have boxes. I could hear of no house provided with a cesspool.

The well at the lumber yard was the only one that showed any visible sources of contamination.

ARTHUR LEE BROWNE,
Inspector State Board of Health.

To James A. Steuart,
Secretary State Board of Health.

BALTIMORE, December 29, 1893.

DR. JAMES A. STEUART,

Secretary State Board of Health,

1611 *John street, Baltimore, Md.*

MY DEAR SIR: As you know, there is considerable difficulty in establishing standards for judging the fitness of water for drinking purposes. As per your instructions, some time ago I drew up the table of limits, which we have been using for the past few months. These limits are not to be understood as fixed, and only show the conditions which condemn a water under ordinary circumstances. William Ripley Nickols, in his work, "Water Supply," says: "To fix a definite standard which will apply to all waters, and by which anyone can judge of a given water by the numerical results of analysis is impracticable. Every doubtful water must be considered by itself, with all the light that can be brought to bear upon it." Professor Mallet, in a report to the United States government on water analysis, draws up the following general conclusions:

1. "It is not possible to decide absolutely upon the wholesomeness or unwholesomeness of a drinking water by the mere use of any of the processes for the estimation of *organic matter* or its constituents.

2. "I would even go further, and say that in judging the sanitary character of a water, not only must such processes be used in connection with the investigation of other evidence of a more general sort, as to the source and history of the water, but should even be deemed of secondary importance in weighing the reasons for accepting or rejecting a water not manifestly unfit on other grounds.

3. "There are no sound grounds on which to establish such *general* 'standards of purity' as have been proposed.

4. "Two entirely legitimate directions seem to be open for the useful examination, by chemical means,

of the organic constituents of drinking water, namely: First, the detection of *very gross* pollution, such as the contamination of the water of a well by accidental bursting or clashing of soil pipes, extensive leakage of drains, etc., and secondly, the periodical examination of a water supply, as of a great city, in order that the normal or usual character of the water having been previously ascertained, any suspicious changes which from time to time may occur shall be promptly detected and their cause investigated.

5. "In connection with this latter application of water analysis, there seems to be no objection to the establishment of *local* 'standards of purity' for drinking water, based on a sufficiently thorough examination of the water supply in its usual condition." (National Board of Health Bulletin, May 27, 1882.)

The limits we use are, therefore, applicable to waters that have suffered gross pollution, and in the cases of doubt, we have to analyze several waters of the same neighborhood of undeniable purity, in order to establish a local "standard of purity."

The authentics for the standards chosen are as follows:

Total solids not to exceed 500 parts per million—Wauhlyn, Reichart, Kubel & Tieman, Wibel, Fiecher—

Chlorine—This limit was fixed upon after a tabulation of a large number of analyses of water from various parts of the State.

Free and Albumenoid Ammonia—Wauhlyn, Chapman and Smith.

Nitrates—Reichart, Kubel & Tieman and Wibel.

Nitrites—Mallet and Nickols.

As you have instructed me, I am tabulating the analyses of water, analyzed from the various localities and cities, so that we may be able, in time, to establish these desirable local "standards of purity" in a future report.

We thus see that it is essential, that in judging the fitness of water for drinking purposes, that a knowledge of the surroundings is desirable. Fox, in his sanitary examination of water, air and food, says: "It is the golden rule in water analysis, never to give an opinion unless the analyst knows; (1) the nature of the source of the water—whether it comes from a spring, well, river or rain reservoir, etc.; (2) the depth of the well, if it is withdrawn from one; (3) the geology of, from which it is derived, together with the soil and subsoil; (4) the distance from the source of the water of the nearest filth or drain." The results of our work in the prevention of epidemics of typhoid fever, or other infectious diseases, have been so satisfactory, that in conclusion I must avail myself of the opportunity to express my thanks to you for the manner in which you have allowed me to use the information collected in the course of your experience in sanitary investigations. Very truly yours,

W. B. D. PENNIMAN,
Analyst.

ANALYSES OF MILK.

BALTIMORE, December 29, 1893.

DR. JAMES A. STEUART,
Secretary State Board of Health,
1611 *John street, Baltimore, Md.*

MY DEAR SIR: The standard for the purity of milk, quoted in my report to you on analyses of milk, is that of the New York law, founded on the result of some examinations of Dr. E. W. Martin, and reported in the fourth annual report of the New York State Board of Health. The standard was fixed on as a minimum after an extensive series of examinations of milk from cows of various breeds and under widely different conditions of age and time of the year. His results are tabulated in the attached statement.

Very truly yours,

W. B. D. PENNIMAN,
Analyst.

RESULTS OF DR. E. W. MARTIN'S ANALYSES OF MILK.

Fourth Report New York Board of Health.

CONSTITUENTS.	Maximum.	Minimum.	Average.	Milk in transit.
Water	82.04	87.87	87.5	87.5
Fat	7.59	2.78	3.3	3.2
Sugar	5.39	4.60	4.4	4.4
Cascine	4.34	4.30	4.1	4.1
Salts	.71	.65	.7	.7
Total solids	17.96	12.13	12.5	12.5
Solids not fat	10.37	9.35	9.2	9.2

"Of the minimum amount of fat given above only three cows were found giving milk so poor in fat, and their food and surroundings were of the poorest kind."

INSPECTION OF DAIRY FARMS

BY STATE BOARD OF HEALTH.

On May 6th, Inspector Godman was ordered to inspect and report upon as many of the dairy farms as could be reached now furnishing the major portion of the milk consumed in the city of Baltimore. His report is reliable, and I submit it herewith for the benefit of the public. I will take occasion to say here that one of the first things to which I turned my attention, upon assuming the duties of Secretary State Board of Health (May 1, 1893), was the character of the milk supplied to the inhabitants of Baltimore. My jurisdiction as Executive Officer of the State Board of Health being entirely outside of the city of Baltimore, my inspections have been confined to the districts beyond the reach of the authority of the City Board of Health.

The following is the report of Mr. G. R. Godman, Inspector of Cattle and Meats:

REPORT OF G. R. GODMAN, INSPECTOR OF CATTLE AND MEATS.

BALTIMORE, May 19, 1893.

To DR. JAMES A. STEUART,
Secretary and Executive Officer
State Board of Health:

In accordance with your instructions to inspect all dairy farms and cattle supplying milk to dairies, I left Baltimore on Monday, 8th inst., at 7.30 A. M., via Baltimore and Lehigh Railroad. My first inspection was to farm of D. S. Whiteford, Cambia Station, Harford county, 42 miles from Baltimore. I inspected thirty milch cows on this place. I found them sound and healthy in every respect. They are mostly improved breeds.

His stable arrangements are complete as to ventilalation, light and drainage, and very clean. Feeds grain and hay; no swill. His milk is cooled in running water, and dairy arrangements complete.

My next inspection was the farm of High Bros., Highland Station, Harford county, 38 miles from Baltimore. Inspected here thirteen cows. I found them all healthy and in good condition. His stable arrangements good as to ventilation, light and cleanliness; drainage good; feeds grain and hay; no swill. His dairy arrangements good.

My next inspection was the farm of J. W. Webster, "The Rocks," 35 miles from Baltimore, Harford county. Has twenty-four cows, all in good healthy condition; feeds grain and hay; no swill. His stable arrangements are good. Dairy arrangements also first-class. Milk cooled by running water.

My next inspection was the farm of H. J. Horn & Sons, Sharon Station, 32 miles from Baltimore. Found here one cow afflicted with tuberculosis. Ordered her isolated from the herd, and no use to be made of milk, and destroyed if no improvement in her condition. Mr. Horn was ignorant of the condition of cow; re-

ceived my instructions and orders cheerfully. The balance of the cows healthy and fair condition; feeds grain and hay; no swill. Stable fair condition; made suggestions for improvement in regard to light and ventilation. Dairy arrangements good; plenty of running water. Twenty cows.

Next inspection was to farm of Charles Whitaker, Forest Hill, 30 miles from Baltimore. Twenty-two cows. He has a very fine lot of cattle, all healthy and in good condition. Feeds grain and hay; no swill. He has good stable, but I suggested that it would be advisable to increase his facilities for more light and ventilation, to which he acceded. His dairy arrangements very good, plenty of pure water for cooling milk.

Next inspection was farm of Otto D. Wilson, Forest Hill, 30 miles from Baltimore. He has a very fine lot of ten cows, all healthly and in good condition and clean. Stable first-class as to ventilation and light; drainage good. Feeds grain and hay; no swill. Dairy arrangements very good. This place is worthy of commendation.

Next inspection was the farm of Hon. Herman Stump, Belair, 26 miles from Baltimore. Eighteen cows. Feeds grain and hay; no swill. Stable and dairy arrangements very good. Cows healthy and in fair condition.

Next inspection was farm of C. E. Baldwin, Baldwin Station, 18 miles from Baltimore. Twenty cattle. He has a first-class herd of cows, mostly improved breeds; all healthy and in good order. Feeds grain and hay; no swill. Has very fine stable, well arranged, drained and lighted. Dairy arrangements first-class. Milk cooled in pure running water.

Next inspection was farm of Leonard Ford, Hyde Station, 17 miles from Baltimore. Twenty cows, all healthy and in good condition. Feeds grain and hay; no swill. His farm well adapted to dairy purposes. Stable properly ventilated and drained. Dairy very good.

Next inspection was the farm of F. J. Foard, Glenarm Station, 15 miles from Baltimore. Twenty cows. Feeds grain and hay; no swill. Cows healthy and in good condition. Stable all right, well ventilated and drained. Dairy in very good order; plenty running water.

My next inspection was the farm of J. B. Foard, Long Green, 16 miles from Baltimore. Twenty cows. Feeds grain and hay; no swill. His cows all healthy and in good order. Stable and dairy in first-class order; plenty of running water.

My next inspection was the farm of Mrs. J. Wisnam, Glenarm Station, 15 miles from Baltimore. Twelve cows. She has a good herd, all healthy and in good condition. Feeds grain and hay; no swill. Stable good, ample ventilation and light; well drained. Dairy arrangements very good.

Next inspection was the farm of J. W. B. Clayton, Glenarm Station, 15 miles from Baltimore. Thirty cows. Feeds grain and hay; no swill. He has a fair herd of cows, all healthy with exception of one cow, which was afflicted with lump jaw. Ordered this cow isolated from herd, and milk stopped. Has an idea she can be cured. Stable and dairy arrangements all right; plenty running water.

This is last inspection on Baltimore and Lehigh Railroad.

On May 18th, my next tour of inspection was farm of W. A. Forrke, Sherwood Station, Northern Central Railroad, 9 miles from Baltimore. Twenty cows. Feeds grain and hay; no swill. He has a very fine herd of cows, all healthy and in fine order. His farm well adapted to dairying. His stable and dairy all in first-class order.

Next inspection was farm of S. H. & J. W. Lyon, Western Maryland Railroad, 10 miles from Baltimore. Fifty-five cows. Feeds grain and hay; no swill. This herd in thorough order, healthy and good condition. Dairy arrangements good; milk cooled in pure run-

ning water. Stable in very good order, well ventilated and clean; drainage good. They have a fine farm, good pasture and plenty of water for stock.

Next inspection was farm of Geo. B. Buckey, Jr., Union Bridge, Western Maryland Railroad, 40 miles from Baltimore. Twenty-five cows. Feeds grain and hay; no swill. He has a good herd, all healthy and in good order. Stable first-class, ventilation good, and well drained. Dairy all right. Has fine farm, well adapted for dairying.

In general it can be stated that the country inspected is high and rolling, water abundant, and good soil; plenty of grass and well adapted for stock. The farms visited by me are above the average.

G. ROBT. GODMAN,
Inspector.

In submitting the above report, it gives me pleasure to state the excellent condition of the dairy-farms from which the milk used in Baltimore comes. Further inspection will be made, and I would be indebted if all milk dealers would send me the names and addresses of the persons from whom they procure their milk, that I may have a thorough examination made of all of them.

JAMES A. STEUART, M. D.,
Secretary State Board of Health.

BALTIMORE, June 28, 1893.

DR. JAMES A. STEUART,
Secretary State Board of Health.

DEAR SIR: According to your instruction, I examined the cow of Mr. Manaden, above Woodbrook Station, on Western Maryland Railroad, and find that the enlargement on her jaw is from a hurt and not disease. I so informed the owner.

Respectfully yours,
G. ROBT. GODMAN,
Inspector.

BALTIMORE, June 23, 1893.

DR. JAMES A. STEUART,

Secretary and Executive

State Board of Health.

DEAR SIR: In compliance with your order, I inspected the dairy-herd of B. F. Darbie, at Clermont, on Baltimore and Lehigh Railroad.

I found his cattle in very good condition. He has a herd of thirty-eight cows, principally Jerseys. Dairy in very good condition; ships sixty gallons milk daily. Stabling very fine as to ventilation and light; one of the best in that section. Feeds no swill.

Respectfully yours,

G. ROBT. GODMAN,

Inspector.

BALTIMORE, June 30, 1893.

TO DR. JAMES A. STEUART,

Secretary State Board of Health:

My report to you will be from April 1st to date. Up to that time I had made my report to Dr. Chancellor.

I have made sixteen inspections of dairy herds on Western Maryland and Baltimore and Lehigh Railroads, as reported to you; also two inspections at Highlandtown. Have inspected between 7,000 and 8,000 cattle.

I condemned and destroyed, at Claremont Stock Yards, 15 lump jaw steers, 3 tuberculosis steers, 2 cancer cows, 5 tuberculosis cows at Sheppard Asylum, and 1 lump jaw steer at Highlandtown.

I have given strict attention to the different markets, and find them in very good condition, and have not had cause to condemn any meats. I have also to report the western meat houses in good condition.

G. ROBT. GODMAN,

Inspector.

BALTIMORE, September 30, 1893.

DR. JAMES A. STEUART,

Secretary State Board of Health.

Report of G. R. Godman, inspector, for July, August and September, 1893:

July. I inspected at Claremont Stock Yards 7,600 cattle, 2,700 sheep, 300 calves; also gave market houses and Western Meat House a thorough inspection. My condemnation for the month consists of 13 cattle with lump jaw, stock yards: 75 pounds corned beef, at Lexington Market; 350 pounds bologna sausage, Western Meat House; 1 cow with tuberculosis, at Rockville, Maryland.

August. Inspected at stock yards 9,000 cattle, 1,500 sheep, 150 calves. Western meat houses and market houses as above. Condemned and destroyed 5 cattle, at yards, with lump jaw; 25 sheep, with itch and foot rot; 600 pounds bologna sausage, western meat house.

September. Inspected at stock yards 11,500 cattle, 4,000 sheep, 350 calves. Condemned and destroyed 7 cattle with lump jaw; also inspected several dairy-herds and found them all right. I am glad to state there is a decided improvement in our market houses, both for cleanliness and quality of meats offered for sale. Western meat houses also in very good condition.

Total Cattle	28,100
" Sheep	8,200
" Calves	800
Total	37,100

Respectfully submitted,

G. R. GODMAN,

Inspector.

BALTIMORE, October 31, 1893.

DR. JAMES A. STEUART,

Secretary State Board of Health:

Report of G. R. Godman, Inspector, for month of October:

Cattle inspected, 12,817; sheep inspected, 8,990; calves inspected, 780. Condemned three cattle with lump jaw during month. Market houses and western meat houses in very good condition.

Respectfully,

G. ROBT. GODMAN,
Inspector.

BALTIMORE, December 1, 1893.

DR. JAMES A. STEUART,
Secretary State Board of Health:

Report of G. R. Godman, Inspector, for month of November:

Inspected at State Scales 16,590 cattle, 7304 sheep, and 985 calves. Condemned two cattle, lump jaw. Market houses and western meat houses in good condition.

Respectfully,

G. ROBT. GODMAN,
Inspector.

BALTIMORE, December 13, 1893.

Receipts of Live Stock at Union Stock Yards from January 1, 1893, to November 30, 1893, inclusive.

MONTHS.	Hogs.	Calves.	Cattle.	Horses.	Sheep and Lambs.	Mules.	Cars.
January	55 896	1,537	8,942	173	13,399	93	1,060
February	45,256	1,145	5,056	438	8,231	119	733
March	43,391	1,315	6,727	477	7,755	165	829
April	40,738	1,769	5,129	594	11,976	128	759
May	43,442	1,648	9,122	467	21,750	76	1,053
June	36,321	1,820	6,487	218	32,858	87	900
July	41,231	1,410	9,487	104	30,717	.....	1,144
August	33,916	1,880	18,330	187	35,492	53	1,466
September	44,747	1,562	19,571	168	29,168	124	1,674
October	46,573	1,823	20,325	232	28,749	123	1,638
November	44,544	1,299	18,351	352	18,999	105	1,475
Total	476,055	17,208	127,527	3,410	239,094	1,073	12,731

BALTIMORE, December 13, 1893.

Shipments of Live Stock at Union Stock Yards from January 1, 1893, to November 30, 1893, inclusive.

MONTHS.	Hogs	Calves.	Cattle.	Horses.	Sheep.	Mules.	Cars.
January	12,761	31	5,586	127	1,872	3	471
February	8,683	116	2,311	282	442	85	237
March	6,741	92	3,936	303	.....	52	330
April	5,837	172	2,839	361	1,118	51	261
May	7,050	121	4,414	213	7,353	15	411
June	5,852	488	4,177	120	18,308	59	416
July	6,670	802	6,453	44	17,296	.....	555
August	6,816	664	12,101	50	20,591	51	855
September	9,530	626	16,802	102	13,296	109	1,105
October	9,605	464	13,827	174	12,479	106	921
November	9,988	212	13,721	298	8,738	87	884
Total	89,533	3,788	86,167	1,074	101,483	618	6,446

BALTIMORE, December 13, 1893.

Shipments of cattle from Union Stock Yards to Europe:

	Head Cattle.
January	4,581
February	1,536
March	2,644
April	1,876
May	2,151
June	2,476
July	3,226
August	2,990
September	6,375
October	3,566
November	2,616
Total	34,037

BALTIMORE, January 1, 1894.

DR. JAMES A. STEUART,

Secretary State Board of Health:

Report of inspections for month of December:

Inspected at Claremont Stock Yards 7,139 cattle, 4,740 sheep and 924 calves; destroyed one bruised bullock.

Inspected, as per order, Wm. McCauley's place at Ellicott city; found everything all right.

Market houses and western meat houses in first-class condition.

Respectfully,

G. R. GODMAN,

Inspector.

REPORT OF FISH INSPECTOR.

BALTIMORE, December 4, 1893.

To the Secretary of the State Board of Health:

I hereby tender you my report as Fish Inspector for the month of November:

Condemned 1670 pounds of fish, 80 wild ducks, 35 rabbits, 700 oranges, and 250 lemons.

Respectfully,

JOSEPH M. ANDERSON,

Fish Inspector.

BALTIMORE, October 2, 1893.

To the Secretary of the State Board of Health:

I hereby tender you my report as Fish Inspector for the quarter ending September 30, 1893:

Number of inspections made to the above date, 165. Condemned 6,376 pounds of fish, 905 dozen of crabs, 50 gallons of oysters, 300 pounds of grapes, 551 canteleups, 350 pineapples, and 462 lemons.

Disposition Dump: The dealers of the markets have been forced to keep a much better quality of fish under the present system of inspection.

JOSEPH M. ANDERSON,
Inspector, 502 S. Ann street.

BALTIMORE, October 31, 1893.

To the Secretary of the State Board of Health:

Report of Fish Inspector for October:

Number of inspections, 53. Condemned 2,750 pounds of fish, 10 barrels of oysters, 60 dozen eggs, 35 dozen lemons, and 90 gallons of oysters.

Very respectfully,
JOSEPH M. ANDERSON,
Fish Inspector.

LAKE ROLAND AND TRIBUTARIES.

OFFICE OF COUNTY COMMISSIONERS OF BALTIMORE CO.
TOWSON, MD., May 10, 1893.

To the Water Board of Baltimore City.

GENTLEMEN: The Board of County Commissioners of Baltimore county have inspected the premises of the jail at this place, and are perfectly willing to do whatever is in their power to remedy the evil complained of. As your body are in a better position, from your experience, to know best how to remedy it, we desire to consult with you at as early date as possible, so as to get your views as to the best course to pursue.

Will you kindly fix your time for an interview and let us know? Very respectfully,

W. B. WARNER.

OFFICE OF THE WATER BOARD, CITY HALL,
BALTIMORE, May 12, 1893.

To the HON. FERDINAND C. LATROBE,
President Water Board.

DEAR SIR: The committee appointed by the Board to investigate and report on the streams feeding Loch Raven and Lake Roland, beg to make their first report. That we visited Towson Run, which, from dividing flow just above Towson, runs through the town and by the jail on through Sheppard Asylum grounds to Lake Roland.

We found the stream from the divide receiving all the drainage and debris from the houses on the stream, and when we came to the jail, we unhesitatingly pronounce the condition as dangerous to the purity of Lake Roland.

We had an interview with Mr. Robert Magruder, President of the Baltimore County Commissioners, who promised to inspect the premises, and we here hand you a communication from the Board, showing that they appreciate the condition and are ready to do what they can to remedy the nuisance complained of.

As the Water Board nor our City Health Department do not seem to have any power to protect the water sheds from pollution, and while the County Commissioners seem ready to meet and remedy evils when pointed out, we deem it our duty to recommend that the matters complained of be referred to the State Board of Health, which body has all power over such matters, and with their authority, and willingness on the part of the County Commissioners, and the encouragement of our Board, we believe that the nuisances can and will be promptly remedied or abated.

Respectfully,

JOHN E. HURST,
F. H. HAMBLETON,
D. MEREDITH REESE,
Committee.

MAYOR'S OFFICE,

BALTIMORE, May 17, 1893.

DR. JAMES A. STEUART,

Secretary State Board of Health.

DEAR SIR: I send enclosed a copy of a report made to the Water Board by a committee appointed for the purpose, calling the attention of the Board to the nuisance on the streams feeding Loch Raven and Lake Roland.

We earnestly hope that the State Board of Health will lend all their aid and assistance to the Water Board in abating this nuisance.

Yours, very respectfully,

FERDINAND C. LATROBE,

Mayor.

HEALTH DEPARTMENT,

BALTIMORE, May 24, 1893.

HON. F. C. LATROBE,

Mayor and Chairman Water Board, City Hall.

MY DEAR SIR: I have the honor herewith to hand you an analytical report upon the water of Lake Roland and its tributaries, made to me by Prof. W. B. D. Penniman, of the Baltimore Medical College, and in response to your communication of the 17th inst.

It will be seen that the observations of Messrs. John E. Hurst, F. H. Hambleton and D. Meredith Reese, in reference to the conditions obtaining in and around Towson, as well as the streams flowing thence into Lake Roland, are, to a certain extent, confirmed, and call for prompt action on the part of all concerned. As Executive Officer of the State Board of Health, I shall call upon the County Commissioners of Baltimore county to forthwith adopt such measures as will abate the nuisance existing at Towson jail and flowing therefrom. This is a duty they owe to the prisoners in the jail as well as to the public of Baltimore. An order will also be promulgated to all owners or occupiers of premises situated along the course of

Lake Roland's contributary streams, to so regulate the drainage from their privies, stables, barn-yards, pig-pens, etc., as to prevent the overflow from gaining direct access to these contributary streams.

In conclusion, I beg leave respectfully to state that (whilst it is our duty to keep a very watchful eye upon so important a matter as the drinking water of a great city like Baltimore), in the opinion of the undersigned, the water of Lake Roland is still quite within the boundaries of safety, and that the public need not be alarmed in regard to danger from this source.

Very respectfully,

JAMES A. STEUART, M. D.,
Secretary State Board of Health.

BALTIMORE, May 26, 1893.

JAMES A. STEUART, ESQ., M. D.,
Secretary State Board of Health.

MY DEAR SIR: I hand you herewith copies of eight analyses of water. All of these are in regard to the Lake Roland supply. which is now being investigated as per your instructions of recent date. The method of inspection was to start at the head of the water course and follow it to its mouth, taking samples at intervals and noting the "danger points."

The specimens and notes that we took while investigating Towson run are as follows:

Sample No. 2. Towson run flowing through Sheppard Asylum property. This branch of the stream takes its origin from several sources, one of which runs along York road and receives the drainage from part of Towson, being indeed a sewer to all intents and purposes. Another branch rises above York road and receives the drainage from twenty-three houses (all of which have surface privies) and five stables.

The analysis of this water shows that it is very much contaminated, and there is a very bad condition of affairs, indeed, at this point.

Sample No. 3. From run below Towson jail, which contains about forty inmates. The sewage from this institution is run into a well fifteen feet deep, five feet in diameter. This well is full, and a constant stream of water from the privy empties into Towson run. This is a very serious source of contamination, and, as you will note, the water is in extremely bad condition from a sanitary standpoint.

Sample No. 5. Junction of Towson run and Sheppard run, half a mile from both places, and about one mile from Lake Roland. The water at this point is in fair sanitary condition. Most of the fecal matter has been oxidized and changed to a harmless form. The amount of detrimental matter has also been very much diluted by the increase of size of the stream. At this point the sanitary condition of the water is fair.

Sample No. 6. Branch of Towson run, called Sheppard's run, flowing through the Asylum property, receiving drainage from the farm-stable and asylum laundry. This water is at present in bad condition, but changes are being made by the asylum authorities which will render this supply harmless.

Sample No. 7. Mouth of Towson run, at Lake station. This is the general analysis of this supply to our water-shed, and shows the water to be in a very bad sanitary condition.

Sample No. 8. From a small stream above Lake station. This water is in fair sanitary condition.

Sample No. 9. From mouth of Roland run. This water is in fair sanitary condition, although its quality can be improved, as it shows signs of contamination.

Sample No. 10. Jones' falls at Rockland station. This water is slightly contaminated, and the source of its impurities will be investigated and corrected.

In general, it may be said, that although there is a very considerable improvement possible in Lake Roland water supply; at present the condition is not such that there is occasion for alarm. The quality of the water is much better than is supplied to most cities, and compares favorably with any of which I am aware. This is no reason, however, for us to relax our efforts to obtain in the best condition possible our supply of this element.

Yours very truly,

W. B. D. PENNIMAN,
Analyst.

BALTIMORE, June 1, 1893.

DR. JAMES A. STEUART,
Secretary State Board of Health,
1611 *John Street, Baltimore, Md.*

MY DEAR SIR: Attached please find copies of analyses 11 to 18 inclusive, with notes taken when samples were drawn. You will note that these analyses show that the main feeder to Lake Roland, viz.: Jones' falls, is in good condition from a sanitary standpoint. The small stream running through the Lake Roland railroad property, immediately by the lake, is also in good condition from a sanitary standpoint. (Analysis 17.)

Yours very truly,

W. B. D. PENNIMAN,
Analyst.

NOTES ON SAMPLES OF WATER NOS. 11 to 18 INCLUSIVE.

May 30, 1893.

Sample No. 11. Stream flowing into falls just below Rockland. Sanitary conditions good.

Sample No. 12. Junction of this stream and race of mill at Rockland with Jones' falls. Mill at Rockland closed permanently.

Sample No. 14 Jones' falls at crossing of Sherwood road.

Sample No. 15. Jones' falls below Rockland Bleach and Dye Work Co.

Sample No. 16. Lake Roland at gate house.

Sample No. 17. Stream emptying into Lake Roland about 300 yards above gate house.

Sample No. 18. Drawn from tap in laboratory, Baltimore Medical College, Madison street and Linden avenue.

Yours very truly,

W. B. D. PENNIMAN,
Analyst.

ANALYSES OF WATERS LAKE ROLAND WATER SHED.

Parts per million (1,000,000).

	SAMPLE NUMBERS—							
	11	12	13	14	15	16	17	18
Total residue	125.	95.	268.	97.	105.	135.	108.	95.
Inorganic residue	105.	71.	198.	74.	81.	108.	85.	76.
Organic residue	20.	24.	70.	23.	23.	27.	23.	19.
Chlorine	3.33	3.33	8 1	3.81	4.18	4.76	5.24	4.17
Free ammonia	.015	.03	.018	.02	.03	.038	.03	.036
Albumenoid ammonia	.045	.044	.03	.055	.07	.08	.09	.073
Nitrates	.04	.05	.28	.05	.055	.06	.16	.17

None of these waters contain nitrites. All of them are clear, colorless and odorless. Neutral in reaction. Copy of notes herewith.

W. B. D. PENNIMAN, *Analyst.*

LAKE ROLAND AND TRIBUTARIES.

LAKE ROLAND

Source.	Towson run.	Stream below Towson jail.	Towson run.	Sheppard's run.	Mouth of Towson run.	Stream above Lake station.	Roland run.
Sanitary surrounding.	bad	bad	fair	good	good	fair	.....
Color.....	none	none	none	none	none	none	none
Odor.....	none	bad	none	none	none	none	none
Reaction	neutral	neutral	neutral	neutral	neutral	neutral	neutral
Total solids.....	150.	98.	80.	53.	72.	150.	130.
Inorganic solids.....	122.	62.	75.	48.	61.	132.	122.
Organic solids.....	28.	36.	5.	5.	11.	18.	18.
Amount of chlorine..	19.1	8.08	7.14	4.76	5.23	3.8	3.80
Free ammonia.....	.21	.63	.03	.067	.10	.03	.03
Albumenoid ammonia	.097	.096	.072	.105	.09	.082	.06
Amount of nitrates...	9.	4.6	4.6	6.	2.68	1.41	1.52
Amount of nitrites...	none	trace	none	none	none	none	none
Condition.....	bad	bad	fair	bad	bad	fair	fair
Drawn by	W.B.D.P.	W.B.D.P.	W.B.D.P.	W.B.D.P.	W.B.D.P.	W.B.D.P.	W.B.D.P.
Date	May 19th	May 19th	May 19th	May 19th	May 19th	May 19th	May 19th

AND TRIBUTARIES.

Jones' falls at Rockland station.	Stream flowing through Rockland.	Section of branch and race with Jones' falls below Rockland.	Well at Rockland.	Jones' falls at crossing of Sherwood road.	Jones' falls below Rockland Bleach and Dye Mill.	Stream flowing through Roland Park.	Lake Roland at Gate House.	Lake Roland at mouth of conduit.
.....	good	good	bad	good	.....	good	good	good
none	none	none	none	none	none	none	none	none
none	none	none	none	none	none	none	none	none
neutral	neutral	neutral	neutral	neutral	neutral	neutral	neutral	neutral
185.	125.	95.	268.	97.	105.	108.	135.	103.3
125.	105.	71.	198.	74.	81.	85.	108.	76.5
60.	20.	24.	70.	23.	23.	23.	27.	31.8
3.8	3.33	3.33	8.1	3.81	4.18	5.24	4.76	4.28
.056	.015	.03	.018	.02	.03	.03	.038	.021
.06	.045	.044	.03	.055	.07	.09	.08	.123
2.28	.4	0.5	2.8	.5	.55	1.6	.6	.4
none	none	none	none	none	none	none	none	none
fair	good	good	suspicious	good	good	good	good	fair
W.B.D.P.	W.B.D.P.	W.B.D.P.	W.B.D.P.	W.B.D.P.	W.B.D.P.	W.B.D.P.	W.B.D.P.	A.L.B.
May 19th	May 30th	May 30th	May 30th	May 30th	May 30th	May 30th	May 30th	Sept. 22d

BALTIMORE, July 11, 1893.

DR. JAMES A. STEUART.

MY DEAR SIR: There is a well on the property I occupy at Mount Washington, the water of which is tainted and smells peculiar, and the well also smells foul.

I discover along the edge of the platform, where the wood is decaying, and in the damp earth which supports the platform, many nests of snails, and found they dropped into the well. As some of my family are sick, we attributed it to the water. Upon examining the bottom of the well, we found quite a lot of dead snails.

Will you be so kind as to do me the favor to recommend the well to be cleaned, and that you consider it expedient for the health of my family, that the damp earth at the top be removed, and a cemented wall be substituted.

The party we rent the property from will not consent without a State permit. Your courtesy will be highly esteemed.

Very truly,

SAMUEL HUNT.

BALTIMORE, July 14, 1893.

SAMUEL HUNT, ESQ.

DEAR SIR: Your letter of the 11th inst. duly received, and I would respectfully suggest that you send a specimen of the water (not less than half a gallon, in a clean demijohn) to Prof. Penniman, care Baltimore Medical College, corner of Madison and Garden streets. Then I would advise a thorough cleaning out of the well and boiling all the water used for domestic purposes pending the analysis.

Very truly, etc.,

JAMES A. STEUART,

Secretary State Board of Health

BALTIMORE, July 21, 1893.

DR. JAMES A. STEUART,
Secretary State Board of Health, Baltimore.

MY DEAR SIR: I enclose analysis of water from well at the summer residence of Samuel Hunt, Esq., at Mt. Washington. In accordance with your instructions I visited the place and found the sanitary surroundings in fairly good condition. The drain from the well, however, runs into a slight depression at the back of Mr. Hunt's place. It should be diverted into the adjoining place so that the water would flow freely down the hill. As it flows at present, the drainage from the pump forms a marsh in the depression mentioned above, which might give rise to malaria, and certainly afford a breeding place for mosquitoes. Mr. Hunt, since writing you, has cleaned out the well and also put in a new wall to prevent dirt from dropping in. Both of these were necessary from his account of the condition of the well at the time he first called your attention to this matter.

Yours very truly,

W. B. D. PENNIMAN.

WATER ANALYSIS NO. 29.

Report on Sanitary Examination of Water. Source, well of house of Samuel Hunt, Esq. Drawn by W. B. D. Penniman, M. D., July 14th, 1893. Remarks on sanitary surroundings.

PHYSICAL PROPERTIES.

Color, none. Odor, none. Reaction, neutral.

	Chemical Analysis.	Parts per 1,000,000.
(1)	Total residue on evaporation at 230° F.	167.0
(2)	Inorganic residue on ignition	150.0
(3)	Organic residue	17.0
(4)	Amount of chlorine	5.7
(5)	Amount of free ammonia	.035
(6)	Amount of albumenoid ammonia	.045
(7)	Amount of nitrates	2.0
(8)	Amount of nitrites	none

CONCLUSIONS.—This water is in good sanitary condition.

W. B. D. PENNIMAN,
Chemist.

BALTIMORE, July 21, 1893.

ELKTON, MD., June 19, 1893.

MY DEAR PROFESSOR: Being desirous to know something of the constituent ingredients contained in certain well waters here in our town and a certain spring, I wrote to Dr. Steuart, asking him to advise me to whom I should send specimens to be analyzed, and his answer was to you. I have sent you to-day by express three samples, marked No. 1, No. 2 and No. 3. Shall be glad to know what you have to say about each of them as to organic and inorganic constituents as early as convenient, And oblige, very truly yours,

J. H. JAMAR,
State Board of Health.

These samples arrived in bad order, so that Dr. J. was sent fresh demijohns on date of receipt.

ELKTON, MD., June 26, 1893.

MY DEAR PROFESSOR: I have again sent, per express, the three samples of water.

No. 1. This is from a spring from which many drink; is 150 feet from stable; is not fitted with cemented well; no pits or wells near by; know of no cases of illness resulting from its use.

No. 2. This is from our water works, which are located half mile from town, and the character of the water was privately requested prior to its use. The well is 125 feet deep; that is, one well is 125 feet and a more shallow one is 15 feet. Both are within 50 feet of the creek, and it is thought much of the water of the more shallow one finds its way therein by filtration; no privy or stable near.

No. 3. This sample is from a well 27 feet deep; is 100 feet from stable; manure pile is not fitted with water-tight box; also 50 feet from a privy with dry box; no pollution therefrom; no other privies near; one pit 40 feet away; dug to gravel, which receives liquid refuse from kitchen. There are, or have been some cases of illness, but it is doubtful whether trace

able to the use of the waters; but they have had a suspicious taste for some time.

Please report at your convenience, and oblige,

Yours, very truly,

JOHN H. JAMAR,
State Board of Health.

BALTIMORE, June 30, 1893.

DR. JAMES A. STEUART,
Secretary State Board of Health.

MY DEAR SIR: Attached please find copies of analyses of water from Elkton, Md.

These analyses show that the sources from which No. 1 and No. 2 were taken to be in good condition.

I am unable to pronounce positively regarding No. 3. As you see, there are enormous amounts of chlorine and nitrates, which, if they proceed from decaying feces, render the water unfit for use. The very small amounts of other products of decomposition make it appear, however, as though this well may normally contain these substances from other sources. It should be examined later in the year, during the first dry spell. By comparison, we will be able to judge of fitness. In the mean time, it may be classed as "suspicious."

Yours very truly,

W. B. D. PENNIMAN.

BALTIMORE, June 26, 1893.

WATERS FROM ELKTON, MD.

Drawn by J. H. Jamar, M. D. Figures in "parts per million."

SOURCE.	Elkton, Md. No. 1.	Elkton, Md. No. 2.	Elkton, Md. No. 3.
Color	none	slightly cloudy	none
Odor	none	none	none
Reaction	neutral	neutral	neutral
Total solids	23.	65.	391.
Inorganic solids	22.	55.	290.
Organic solids	1.	10.	101.
Amount of chlorine	3.33	3.81	99.96
Free ammonia	trace	.017	.013
Albumenoid ammonia	.012	.04	.023
Amount of nitrates	3.33	1.00	50.00
Amount of nitrites	none	none	none
Condition	good	good	suspicious

BALTIMORE, July 21, 1893.

DR. JAMES A. STEUART,
Secretary State Board of Health.

MY DEAR SIR: I attach a tabulated statement showing the present condition of the water supply of Baltimore, and also show the average amount of impurities present in the water supplies of some of our principal American cities. These analyses were made by A. R. Leeds. You will note that these analyses show that our supply is far superior to any of the cities mentioned.

Yours truly,

W. B. D. PENNIMAN,
Analyst.

BALTIMORE, July 21, 1893.

TABLE SHOWING RELATIVE PURITY OF WATER SUPPLIED TO CITIES.

PARTS PER MILLION.	Philadelphia.	New York.	Brooklyn.	Jersey City.	Boston.	Washington.	Rochester.	Cincinnati..	Baltimore, July 1st.	Baltimore, July 15th.
Total solids	143.	118.	60.	93.	85.	115.	100.	162.	85.	75.
Solids on ignition	.....	.....	.....	.....	.....	.....	.....	.....	69.	67.
Chlorine	3.0	3.5	5.5	2.35	3 15	2.70	1.95	8.05	4.28	4.9
Free ammonia	.008	.022	.006	.039	.108	.049	.093	.094	.04	.022
Albumenoid ammonia	1.47	.221	.067	.344	.496	.221	.188	.196	.07	.075
Nitrogen as nitrates	1.51	1.84	2.69	2.01	2.75	1.84	1.39	1.61	.9	.5
Nitrogen as nitrites	none	none	none	none	none	none	none	none	none	none

BALTIMORE CITY DRINKING WATER—LAKE ROLAND SUPPLY.

DRAWN FROM TAP AT	Baltimore Medical College.	Baltimore Medical College.	Baltimore Medical College.	Hopkins Hospital.	Baltimore Medical College.	Baltimore Medical College.	1317 Druid Hill Terrace.	Hotel Altamont.	Baltimore Medical College.	Baltimore Medical College.
Date	May 31.	July 1.	July 15.	Sept. 22.	Sept. 23.	Oct. 4.	Oct. 4.	Nov. 9.	Nov. 9.	Dec. 15.
Color	none	none	none	none	none	none	none	none	none	none
Odor	none	none	none	none	none	none	none	none	none	none
Reaction	neutral	neutral	neutral	neutral	neutral	neutral	neutral	neutral	neutral	neutral
Total solids	95.	85.	75.	107 8	112.8	109.	100.	108.	111.	120.
Inorganic solids	76.	69.	67.	82.3	88.6	88.	80.	56	55.	83.
Organic solids	19.	16.	8.	25.5	25.2	21.	20.	52.	56	37.
Amount of chlorine	4.17	4.28	4.9	4.76	4.76	4.7	4.7	5.24	4.28	4.2
Free ammouia	.036	.04	.022	trace	.009	trace	trace	.014	.014	trace
Albumenoid ammonia	.073	.07	.075	.064	.042	.12	.12	.022	.07	.105
Amount of nitrates	1.7	.9	.5	.325	.35	.45	.45	.50	.50	.60
Amount of nitrites	none	none	none	none	none	none	none	none	none	none
Condition	good	good	good	good high service	good	fair	fair high service	good high service	good	good

LEELAND, PRINCE GEORGE'S CO., MD.,
July 24, 1893.

JAMES A. STEUART, M. D.

DEAR DOCTOR: Two brothers, Isaac and Edward Grimes (merchants at Hall's station), laboring under typhoid fever five and ten days, respectively, died last Friday night. I visited them in the morning and saw nothing alarming. Upon my return, after 10 P. M., learned that both had died from the effect of hemorrhage from the bowels, a remarkable coincidence and display of ignorance upon the part of the attendants in not securing medical aid.

These brothers occupied the same house until recently. The well, about ten feet deep, situated about thirty feet from a privy, and a spring, used by them at *one house and the store*, about one hundred and twenty feet from a filthy stable and store-house, I consider the cause of contagion. I think it advisable to have the well and spring water analyzed, and write to know if you wish samples forwarded and to whom.

A visit from you would be appreciated, and, I think, advisable, if in your power. Apart from the habits and idiosyncrasy of these young men, the local causes are numerous. Disinfectants have been used and precautions taken to prevent the spread of the disease, but an analysis only can prove that the water is contaminated. Very truly yours,

BENJ. L. BIRD, M. D.,
County Health Officer.

Dr. Steuart, accompanied by Prof. W. B. D. Penniman, went at once to Leeland and Hall's Station, Prince George's county, and there met Dr. Bird, made a thorough examination of the premises and surroundings, as well as of the drinking water derived from several sources and used by the people residing there. Ordered many sanitary changes and improvements to to be made forthwith, and endeavored to stir the peo-

ple up generally in regard to the vital importance of good sanitary surroundings, and especially care over their drinking water supplies.

BALTIMORE, July 28, 1893.

DR. JAMES A. STEUART,

Secretary State Board of Health.

MY DEAR SIR: Attached please find reports of analyses of water at Hall's station, Pope's Creek Line, B. & P. R. R. Co. The notes we took on the spot in regard to the sanitary condition of these waters are as follows:

Spring at Hall's station, near railroad track. Mr. Isaac Grimes, now dead, formerly drew his supply of drinking water from this spring. The spring is surrounded by a wooden box, and is what is known as a "wet-weather spring," *i. e.*, there is no over-flow, and the spring is really a very shallow well. The spring is in a hollow, and from its situation must receive the drainage from the village.

Well at residence of the late Mr. Edward Grimes. This well is very shallow and is only a short distance from the privy, which is a shallow pit about 12 inches deep. The well is a shallow one (about fifteen feet), and from its situation must receive the drainage from the privy.

The analyses of these waters show them to be badly contaminated, and both spring and well should be closed. The former permanently, and the latter until the sanitary arrangements have been improved.

Yours truly,

W. B. D. PENNIMAN,

Analyst.

LEELAND, MD., August 22, 1893.

JAMES A. STEUART, M. D.

DEAR DOCTOR: I received your letter and followed instructions, placing placards, serving notices upon owners of property, etc.

Mr. H. C. Hopkins, at Hall's, wishes to know if his tenant can use the spring water with safety for laundry purposes only?

You stated that the microscopical examination will be reported upon later. wo uld like to have the full report. No new cases of typhoid at Hall's.

Very respectfully yours,

B. L. BIRD, M. D.,
County Health Officer.

BALTIMORE, August 3, 1893.

DR. JAMES A. STEUART,
Secretary State Board of Health.

MY DEAR SIR: I enclose analysis of water from spring at the residence of Mr. Pumphreys, near Leeland station, Pope's Creek line, B. & P. R. R. Co. The water is perfectly pure and may be used for all purposes. Yours truly,

W. B. D. PENNIMAN,
Analyst.

BALTIMORE, July 26, 1893.

WATER FROM HALL'S STATION, AND LEELAND STATION.
POPE'S CREEK LINE, B. & P. R. R. CO.

SOURCE.	Spring at Hall's Station.	Well at dwelling of Ed. Grimes, Hall's Station.	Well at dwelling of Mr. Pumphrey's Leeland Sta'n.
Sanitary surrounding	....	bad	good
Color	none	none	none
Odor	none	none	none
Reaction	neutral	neutral	neutral
Total solids	190.	325.	295.
Inorganic solids	132.	155.	240.
Organic solids	58.	170.	55.
Amount of chlorine	44.3	59.45	4.76
Free ammonia	trace	trace	none
Albumenoid ammonia	.20 / .25	.30	.06
Nitrates	4.50	22.7	3.50
Nitrites	none	trace	none
Condition	bad	bad	good

BALTIMORE, August 8, 1893.

DR. JAMES A. STEUART,

Secretary State Board of Health.

MY DEAR SIR: I hand you herewith report of chemical examination of Hagerstown water supply now being taken form Heyser's dam. Sample forwarded by Dr. T. W. Simmons, County Health Officer.

After a very careful examination of this water I am of the opinion that it is of healthful quality, that is, that it is not injurious to health, although the large amount of vegetable matter present is more or less distasteful. The excess of ammonia present is of vegetable origin, and there is no considerable amount of sewage contamination. The water is strongly impregnated with lime. Yours respectfully,

W. B. D. PENNIMAN,

Analyst.

Microscopical examination shows nothing of non-vegetable character.—W. B. D. P.

At the request of Dr. W. T. Simmons, Health Officer of Washington county, I visited Hagerstown to examine the sources of their public water supply, with a view to the corrections of certain evils alleged to be endangering the purity of the same. After a thorough inspection of the streams in question and a careful chemical analysis (given herewith), the water was pronounced safe for use for domestic purposes. Several important suggestions made by me were adopted.

Report on Sanitary Examination of Water. Source, Heyser's dam, Hagerstown, Md. Drawn by Dr. Simmons, August 3d, 1893.

PHYSICAL PROPERTIES.

Color, none. Odor, slightly fishy. Reaction, neutral.

	Chemical Analysis.	Parts per 1,000,000.
(1)	Total residue on evaporation at 230° F	225.
(2)	Inorganic residue on ignition	230.
(3)	Organic residue	25.
(4)	Amount of chlorine	2.85
(5)	Amount of free ammonia	* .07
(6)	Amount of albumenoid ammonia	.08
(7)	Amount of nitrates	5.89
(8)	Amount of nitrites	None.

*Too high.

CONCLUSIONS.—This water is in fair condition.

W. B. D. PENNIMAN,
Chemist.

BALTIMORE, August 8, 1893.

MT. SAVAGE, MD., Sept. 14, 1893.

W. B. D. PENNIMAN, *Analyst.*

DEAR SIR: I to-day transmit sample of water for analysis. Diphtheria exists in vicinity of the well from which the sample is taken. The doctor thinks the water may be the cause. This sample was sent to my office some eight days ago; was not able, on account of sickness, to send sooner. The water is not used now. Very respectfully,

JOSEPH G. SMITH,
Inspector Local Board of Health.

BALTIMORE, September 29, 1893.

DR. JAMES A. STEUART,
Secretary State Board of Health, Baltimore.

MY DEAR SIR: I attach letter from Joseph G. Smith, Inspector Local Board of Health, Mt. Savage, Md., and the analysis of the water. The water is fit for drinking purposes. Very truly yours,

W. B. D. PENNIMAN.

Report on Sanitary Examination of Water. Source, Mt. Savage, Md. Drawn by Joseph G. Smith, M. D., September 20, 1893.

PHYSICAL PROPERTIES.

Color, none. Odor, none. Reaction, neutral.

	Chemical Analysis.	Parts per 1,000,000.
(1)	Total residue on evaporation at 230° F.	191.8
(2)	Inorganic residue on ignition	150.8
(3)	Organic residue	41.0
(4)	Amount of chlorine	*10 47
(5)	Amount of free ammonia	.018
(6)	Amount of albumenoid ammonia	03
(7)	Amount of nitrates	†trace.
(8)	Amount of nitrites	none

*Too high. †The word trace indicates that the substance is present, but in too small an amount to be determined.

CONCLUSIONS.—This is a good drinking water. The chlorine is high, but it is evidently present as a mineral chloride.

W. B. D. PENNIMAN,
Chemist.

BALTIMORE, Sept. 25, 1893.

BALTIMORE, Sept. 25, 1893.

DR. JAMES A. STEUART,
Health Officer, City.

DEAR SIR: I enclose herewith a communication from the General Superintendent of Motive Power of this company, transmitting analysis of city drinking water from the Gunpowder river as taken from the tap in the laboratory at Mt. Clare.

This for your information and such action as you may think proper. Very respectfully,

S. R. BARR,
Superintendent.

BALTIMORE, Sept. 23, 1893.

S. R. BARR, ESQ.,
Superintendent Relief Department.

DEAR SIR: I enclose herewith report of examination made of the city drinking water from Gunpowder river as taken from a tap in the laboratory, by which you will see that the quality for drinking is poor. Of course, I do not know what you wish to do about the matter, but as we employ a large number of men that have to drink this water, and the company suffers by reason of any outbreak of typhoid fever, it is possible you would like to take the matter up. The albumenoid ammonia, which is given as .013, is very high. A pure water contains about .004, a suspicious water contains about .010, and you will see by the attached analysis that the city water contains .013. A water that should be rejected at once contains .015, from which you will see that the city water is only .002 below the dangerous point.

This matter is entirely for your information and for such action as you may deem necessary.

Respectfully,

G. B. HAZLEHURST,
General Superintendent Motive Power.

MT. CLARE, BALTIMORE, Sept. 21, 1893.

G. B. HAZLEHURST,
General Superintendent Motive Power:

Please find below result of chemical tests of water (Gunpowder) from Baltimore, Maryland. Sample taken by C. P. Van Gundy, September 21, 1893, representing taken from tap in laboratory :

	Grains per Gallon.	Parts per 1,000,000
Total solids	3.85	6.60
Chlorine	.21	.37
Free ammonia		.003
Albumenoid ammonia		.013
Reaction		neutral
Quality for drinking		poor

C. P. VAN GUNDY, *Chief Chemist.*
B. B. HODGES, *Engineer of Tests.*
Approved: G. B. HAZLEHURST, *General Supt. Motive Power.*

BALTIMORE, September 29, 1893.

DR. JAMES A. STEUART,
Secretary State Board of Health, Baltimore.

MY DEAR SIR: In regard to the attached from the B. & O. R. R. Co., concerning the quality of the water supplied to Mt. Clare, I have made (in the course of a very friendly and pleasant controversy between the B. & O. chemists and myself) three sets of determinations of the ammonia, free and albumenoid, as follows:

	Sept. 21.	Sept. 25.	Sept. 28.
Free ammonia	.03	.034	.02
Albumenoid ammonia	.113	.147	.13

The figures obtained by the B. & O. people are—

	Sept. 21.
Free ammonia	.03
Albumenoid ammonia	.15

All in parts per 1,000,000.

Not thinking that the normal supply from Loch Raven could be in the condition shown by a consideration of the figures given on the reports attached, Nos. 1 and 2, I concluded to test another sample from the same section of the city. Camden station was selected, as the analysis of water from this point would be of interest to all concerned, and at the same time another sample was obtained from Mt. Clare Laboratory. (Reports Nos. 3 and 4.)

The figures show that the supply from Loch Raven has deteriorated very much, although the contamination is evidently *not from sewage* as shown by the small amounts of nitrates and chlorine.

There is nothing to be done, as the drought is probably responsible for all the trouble.

Very truly yours,

W. B. D. PENNIMAN,
Analyst State Board of Health.

BALTIMORE, September 29, 1893.

DR. JAMES A. STEUART,
Secretary State Board of Health, Baltimore.

MY DEAR SIR: I attach analysis No. 1 to No. 4 of the water supplied to Baltimore from Loch Raven.

Very truly yours,

W. B. D. PENNIMAN,
Analyst.

LOCK RAVEN WATER.*

	No. 1. Sept. 21st	No. 2. Sept. 25th.	No. 3. Sept. 28th.	No. 4. Sept. 28th.
Source	Mt. Clare.	Mt. Clare.	B.&O.Lab	Camden St'n
Drawn by	A. L. B.	C. P. V.	C. P. V.	C. P. V.
Color	none	none	none	none
Odor	none	none	none	none
Reaction	neutral	neutral	neutral	neutral
Total solids	91.7	91.7	94.	102.
Inorganic solids	66.2	66.2	66.	78.
Organic "	25.5	25.5	28.	24.
Amt. of Chlorine	3.76	3.32	3.81	3.57
" Free ammonia	.03	.03	.02	.02
" Albu. ammonia	.113	.147	.15	.14
" Nitrates	.42	.30	.25	.35
" Nitrites	none	none	none	none

* This water has evidently deteriorated on account of the drought.

BALTIMORE CITY DRINKING WATER—LOCH RAVEN SUPPLY.

DRAWN FROM TAP AT	Mount Clare.	Mount Clare.	Mount Clare.	Camden Station	1016 West Fayette St.	Mount Clare.	Mount Clare.
Date	Sept. 21.	Sept. 25.	Sept. 28.	Sept. 28.	Oct. 4.	Nov. 9.	Dec. 15.
Color	none	none	none	none	none	none	none
Odor	none	none	none	none	none	none	none
Reaction	neutral	neutral	neutral	neutral	neutral	neutral	neutral
Total solids	91.7	91.7	94.	102.	115.	94.	89.
Inorganic solids	66.2	66.2	66.	78.	95.	67.	45.
Organic solids	25.5	25.5	28.	24.	20.	27.	44.
Amount of chlorine	3.76	3.32	3.81	3.57	3.43	3.33	2.4
Free ammonia	.03	.03	.02	.02	trace	.014	trace
Albumenoid ammonia	.113	.147	.15	.14	.18	.057	.09
Amount of nitrates	.42	.30	.25	.35	.45	.45	.67
Amount of nitrites	none	none	none	none	none	none	none
Condition	fair	fair	fair	fair	suspic's	good	good

BALTIMORE, October 5, 1893.

DR. JAMES A. STEUART,
Secretary State Board of Health,
1611 *John Street, city.*

DEAR SIR: As one of the trustees of the estate of the late T. Harrison Garrett, I beg to call your attention to the condition of the stream of water running through "Evergreen," situated on Charles street avenue, north of Cold Spring lane.

The stream has its origin, I believe, north of the Perine property, and flowing south in a valley between the York road and Charles Street avenue, passes through property belonging to St. Mary's Roman Catholic Parish, the Convent of Notre Dame, where there are two large ponds, and taking a westerly course, flows through Evergreen and other properties to Stony run, west of Charles street avenue.

At times, for some years, the stream has been in bad condition, but now its condition is such as to cause alarm, the stench, especially at night, being very bad. The appearance of the water would indicate a very undesirable and unhealthy drainage, but whether it comes from kitchens or closets I am not able to say.

I am, very respectfully,
C. NITZE.

BALTIMORE, November 7, 1893.

DR. JAMES A. STEUART,
Secretary State Board of Health, Baltimore.

DEAR SIR: I enclose duplicate copies of my sanitary report upon the stream flowing through "Evergreen," T. Harrison Garrett's estate.

Attached please find letter of Mr. C. Nitze to you bearing upon this subject.

Yours truly,
ARTHUR LEE BROWNE,
Inspector.

Inspection of stream running through "Evergreen" (T. Harrison Garrett's estate).

This stream rises on the Perine property, near Melrose avenue, and flows in a southerly direction between the York road and Charles street avenue. The origin of this stream is the overflow from three (3) springs, all in excellent condition, being walled up and covered over. The stream is divided on the Perine property to form several small ponds. These ponds receive all the surface drainage from the roads, etc., through large drain pipes. Below these ponds the stream is fed by several smaller streams.

At Homeland avenue the stream leaves the Perine property and enters that of Mr. Albert. Up to this point there seems to be no contamination other than all small streams are liable to, namely, decaying leaves.

On the south side of Homeland avenue, on the Albert property, the stream is undoubtedly contaminated on the west side of the stream, but twenty (20) yards from its bank is a small dwelling house (occupied). The stable and pig-sty attached to this house are respectively five yards and three yards from the stream, the drainage from all being directly into the stream. To the west of this house, about 100 yards from the stream, is the graveyard of St. Mary's Church. The fall of the land is from the graveyard to the stream.

Below this house the stream broadens to form an ice pond. Here, there is an open ditch, or gutter, that carries all the waste water, slops, etc., from the gardener's house, and from an old barn (Albert's property). This empties into the stream, and was pouring a considerable stream of filthy water when I saw it. Adjoining the barn is a chicken yard, from which any rain would wash the dirt into the pond.

The sanitary surroundings of the stream at this point were *bad*.

The stream next enters the Notre Dame property. Here there is a stable and a pig-sty near the stream. Below this point the stream is dammed to form two small ponds, which are used for boating, and in winter serve as ice ponds. Below these ponds, about four yards from the Garrett property and three yards from the stream, is an old privy. This privy has no box, but is seldom, if ever, used. Below this privy there is a large drain-pipe, about ten inches in diameter, which comes from Notre Dame and empties into the stream at a point but a few feet north of the Garrett property. This drain pipe carries all the matter from the water-closets, wash-house and gas-house. When I saw this pipe it was pouring a stream six inches in diameter into the stream proper of most filthy water. The stream below this point is in a most filthy condition, its banks in places being strewn with pieces of paper, etc., and the odor was most offensive.

I think the whole source of complaint is this pipe, as the water above was clear and odorless, while below it has a very offensive odor and is extremely dirty in appearance.

I am of the opinion that this can be remedied by turning this drain water into a gravel-bed and thus let it percolate through the soil.

ARTHUR LEE BROWNE,
Inspector State Board of Health.

BALTIMORE, November 13, 1893.

DR. JAMES A. STEUART,
Secretary State Board of Health, Baltimore.

MY DEAR SIR: I enclose to you analytical report of the water from the stream flowing through "Evergreen," belonging to the estate of T. Harrison Garrett. A sample was also taken above the principal source of contamination. The analyses confirm very markedly the report of Mr. Arthur Lee Browne, Inspector State Board of Health, and I fully agree with him as to the

reason of the trouble and complaint. The foul odor is due very largely to the waste from the gas house.

Yours very truly,

W. B. D. PENNIMAN,
Analyst State Board of Health.

WATER FROM STREAM RUNNING THROUGH "EVERGREEN."

Figures in parts per million. Drawn by A. L. Browne.

SOURCE.	Water from stream *above* the Notre Dame drain-pipe.	Water from stream *below* the Notre Dame drain-pipe.
Color	none	milky
Odor	none	bad
Reaction	neutral	alkaline
Total residue 230° F.	115.	198.
Residue on ignition	59.	111.
Organic residue	56.	87.
Amount of chlorine	4.39	21.42
Amount of nitrogen as ammonia	.308	.769
Amount of nitrogen as albumenoid ammonia	.300	1.142
Amount of nitrates	trace	trace
Amount of nitrites	none	trace
Condition of water	bad	bad

BALTIMORE, October 6, 1893.

DR. JAMES A. STEUART,
Secretary State Board of Health.

DEAR SIR: Mr. Penniman requested me to send you the attached analysis of city water, and also to state that he could hear of but two cases of typhoid fever in the city. The first case, Mr. Richardson, of 1016 W. Fayette street, and the second case in the family of Mr. Martin Fitzmaurice, of 1317 Druid Hill Terrace. Water from both houses was procured and analyzed. In neither case does the disease seem to have been contracted by drinking the city water. Mr. Richardson was sick in Washington, D. C., before he came to Baltimore, and the other cases are said to be due to drink-

ing the water from a condemned spring in Druid Hill Park. Yours truly,

A. L. BROWNE,
Analyst.

WATER FROM CITY TAPS—Figures in "Parts per Million."

SOURCE—DRAWN BY A. L. BROWNE.	1317 Druid Hill Terrace.	1016 West Fayette street.	Baltimore Medical College.
Color	none	none	none
Odor	none	none	none
Reaction	neutral	neutral	neutral
Total solids	100.	115.	109.
Inorganic solids	80.	95.	88.
Organic solids	20.	20.	21.
Amount of chlorine	4.7	3.43	4.7
Amount of free ammonia	none	none	none
Amount of albumenoid ammonia	.12	.18	.12
Amount of nitrates	.45	.45	.45
Amount of nitrites	none	none	none

UNIONTOWN, MD., October 25, 1893.

DR. W. B. D. PENNIMAN,
Baltimore, Md.

MY DEAR SIR: I have this day expressed you samples of water taken from the different wells here where typhoid fever has been prevailing, and I append the following in answer to your inquiries:

There are no supplies from streams or lakes; all from wells, all sunken, and none prevented from surface drainage, though walled partly, generally from where solid rock begins. These wells are, all of them, on an average, 50 feet deep.

Name and Number.	Nearest privy.	No. of cases of typhoid fever.
No. 1. W. A. Stultz	50 yards.	2
" 2. John Routson	25 "	2
" 3. Jacob Christ	25 "	1
" 4. Lee Erb	25 "	1
" 5. Lewis Selby	10 "	2
" 7. Dr. T. J. Shreeve	30 "	1
" 8. Jos. Dingle	10 "	1
" 9. James Lewis	10 "	1

Hope the bottles will reach you promptly.

Yours very truly,

LUTHER KEMP, M. D.

Baltimore, November 3, 1893.

Dr. James A. Steuart,

Secretary State Board of Health, Baltimore.

My Dear Sir. Attached please find report of analyses of water from Uniontown, Maryland. All of these waters are contaminated, but as I am not familiar with the locality I am not able to say if the condition of these wells can be remedied.

Yours very truly,

W. B. D. PENNIMAN.

BALTIMORE, November 3, 1893.

ANALYSES OF WATERS FROM UNIONTOWN, MARYLAND.

Drawn by L. Kemp, M. D. Figures in "Parts per million."

SOURCE.	Well at house of W. A. Stultz.	Well at house of John Routson.	Well at house of Jacob Christ.	Well at house of Lee Erb.	Well at house of Lewis Selby.	Well at house of Dr. Shreeve.	Well at house of Joseph Dingle.	Well at house of James Lewis.
Color	none	none	none	none	none	none	none	none
Odor	none	none	none	none	none	none	none	none
Reaction	neutral	neutral	neutral	neutral	neutral	neutral	neutral	neutral
Total residue 230° F.	389.	313.	501.	234.	330.	510	467.	213.
Residue on ignition.	216.	173.	269.	146.	217.	315.	253.	103.
Organic residue	173.	140	232.	88.	113.	195.	214	100
Amount of chlorine.	46.6	54.7	106.3	21.8	56 2	126	85.5	15.4
Am't of nitrogen as ammonia.	.03	trace	trace	trace	trace	trace	trace	.06
Am't of nitrogen as albu. ammonia	.05	trace	trace	trace	trace	trace	.13	.08
Amount of nitrates	16.7	20.	23.8	8.6	20.	16.7	13.9	11.7
Amount of nitrites	.004	002	none	none	none	none	trace	none
Condition of water	bad	bad	bad	bad	bad	bad	bad	bad
Sanitary condition of well	bad	bad	bad	bad	bad	bad	bad	bad
Nearest privy	50 yards.	25 yards.	25 yards.	25 yards.	10 yards.	30 yards.	10 yards.	10 yards.
Number of typhoid cases	2	2	1	1	2	1	1	1

W. B. D. PENNIMAN,
Analyst State Board of Health.

BALTIMORE, November 2, 1893.

DR. JAMES A. STEUART,

Secretary State Board of Health, Baltimore.

MY DEAR SIR: Attached please find report of chemical analyses of waters taken from various wells and springs at Towson, Maryland. With the exception of the spring at the toll-gate, all of these waters are contaminated. From these analyses of water we must conclude that the ground on which the town is built is so saturated with organic matter that water drawn from the underlying strata is more or less impure even if the sanitary conditions surrounding the well are good.

The only remedy is to obtain the water supply of the town from some outlying source.

Yours very truly,

W. B. D. PENNIMAN,
Analyst State Board of Health.

Towson well waters, Sanitary Report.

Analysis No. 1. Pump (public) in front of Reed's Hotel, Towson. The nearest privy is 40 yards from this well; everything is caught in boxes, there being no cesspool. There is a stable 60 yards from the well, slightly above the level of the well. The immediate surroundings of the well are in fair sanitary condition.

Analysis No. 2. Pump (public) in front of Collings' butcher shop, Towson. The nearest privy is 100 yards from the well. The excreta is caught in boxes; land slopes slightly from the privy to the well. Immediate surroundings of this well very good.

Analysis No. 3. Well (private) at Samuel Brown's, Towson; nearest privy 20 yards from the well; chicken house 15 yards from the well; condition of both fair. Immediate surroundings of this well fair. This well was dug on the site of an old stable which had been used for many years. There have been several cases

of typhoid in this family within the last two years. Four families are dependent for water upon this pump.

Analysis No. 4. Well (public) court-house yard, Towson; nearest privy 100 yards from the well, on the other side of the court-house. This privy has a large cesspool; the condition of this privy was bad. The immediate surroundings of this well were very good.

Analysis No. 5. Spring (public) at Phipp's toll-gate, Towson; nearest privy 15 yards from this spring and on a higher level; any heavy rain would wash anything towards the spring. The nearest house is but 8 yards from the spring, and so situated that any slops, etc., thrown from the kitchen door would drain into the spring. Immediate surroundings of the spring *bad.*

Analysis No. 6. Well (private) on Major Yellott's property, Towson; nearest privy 60 yards; privy has a box for the excreta. Stable attached to Urban's saloon is 15 yards from this well. Immediate surroundings of this well very bad; pools of slops and dirty water standing around the well. Two families use this well.

Analysis No. 7. Well (private) on property of August Loose, Towson; nearest privy 10 yards; this privy is on the property of Dr. J. J. Piper and has a cemented cesspool. There are two privies 30 yards from this well on a higher level; both have boxes. Dr. Piper's stable is but eight yards from the well. Immediate surroundings good.

Analysis No. 8. Well (public) in front of William Grason's house, Towson; nearest privy sixty yards. This privy has a well; the slope is towards the pump; there is a stable fifty yards from this pump. Immediate surroundings very good.

Analysis No. 9. Well at the Smedley House or Hampton Hotel, Towson. There is a privy six yards from this well which has a cesspool; this privy was in very bad condition. They tell me that this water is not used for drinking purposes. Immediate surroundings very bad.

Analysis No. 10. Well (private) on property of Harry Phipp's, Towson. There are two privies within 25 yards; both have boxes; the excreta from the privies used to be buried where the pump now stands. Immediate surroundings good.

Analysis No. 11. Well (private) on property of D. G. McIntosh, Towson; privy sixty yards from the well; this privy has a cemented cesspool. There are four stables in the rear of this property, all on a slightly higher level than the pump. Immediate surroundings very good.

A. L. BROWNE.

ANALYSES TOWSON WATERS.

TOWSON

Figures in " Parts

Drawn by A. L. Browne.

Source.	Public well Reid Hotel.	Public well Colling' Butcher Shop.	Well at Sam'l Brown's	Public well Court House Yard.
Sanitary surroundings	bad	bad	bad	bad
Color	none	none	none	none
Odor	none	none	none	none
Reaction	neutral	neutral	neutral	neutral
Total residue	152.	443.	559.	167.
Inorganic residue	92.	329.	358	83.
Organic residue	60.	114.	201.	84.
Amount of chlorine	19.99	93.89	110.54	23.59
Free ammonia	trace	trace	trace	trace
Albumenoid ammonia	trace	trace	.06	trace
Amount of nitrates	3.7	6.25	17.86	7.69
Amount of nitrites	trace	.011	trace	trace
Condition of water	bad	bad	bad	bad
Date	Nov. 2.	Nov. 2.	Nov. 2.	Nov. 2.

WATERS.

per Million."

Public Spring, Phipp's Toll-gate.	Well on Maj. Yellott's Property.	Well on Aug. Loose's Property.	Public well at Wm. Grason's.	Well at Hampton Hotel.	Well at Harry Phipp's.	Well at D. G. McIntosh's.	Pump at Towson Jail.	Spring at Mrs. E. B. Almony's Place.
bad	bad	bad	bad	bad	bad	bad	.....	bad
none	none	none	none	none	none	none	none	none
none	none	none	none	none	none	none	none	none
neutral	neutral	neutral	neutral	neutral	neutral	neutral	neutral	neutral
93.	370.	310.	390.	172.	440.	119.	59.	125.
68.	178.	237.	264.	105.	270.	60.	58.	120.
25.	192.	73.	126.	67.	170.	59.	1.	5.
3.7	53.31	48.56	55.5	22.37	104.24	8.09	7 14	23.8
trace	trace	trace	.223	trace	trace	trace	.02	.03
trace	.022	trace	trace	trace	.037	.035	.037	.04
.75	10.87	4 25	20.83	4.25	15.15	3.50	4.6	4.03
none	trace	.006	.19	.019	.023	.037	none	none
good	bad	bad	bad	bad	bad	bad	suspicious	suspicious
Nov. 2.	Nov. 2.	Nov. 2	Nov. 2.	Nov. 2.	Nov. 2.	Nov. 2.	May 26.	May 26.

Four Cases of Lead Eucephalopathy, with Two Fatal Results.

On the evening of February 16th last I was hurriedly called in consultation to see N. S., white, aet. ten years, whom the messenger reported to be dying. I reached the house in a few moments, and found that the messenger was not far from right, as the patient was just passing from convulsions to coma, which rapidly deepened till death occurred in a few hours. The attending physician had diagnosed meningitis, and as he recited to me the symptoms of that disease, the patient in a dying condition, I had no opportunity to ground an honest difference. He further stated that the (meningitis?) was preceded by an attack of (acute indigestion?). Two days later, L. S., a brother, aet. six years, was ill with intestinal pain, headache, nausea and vomiting, moderate fever, delirium, local spasm and general convulsions, and at the same time A. S., a sister, aet. eight years, was suffering with intestinal pain, headache, nausea and vomiting, moderate fever, local spasm, and several times *threatened* with general convulsions. These cases were all attended by the family physician.

Whilst these two children were still sick, I was called from my bed on the morning of the 23d, at one o'clock, to see K. S., another sister, aet. four years, who was seized about midnight with intestinal pain. I was asked to take charge of this case myself, and remained with the family all night. The mother had given my patient a large dose of castor oil before I arrived, which had to be repeated, and other medicine used to overcome a decidedly obstinate constipation. The temperature, when I arrived, was slightly above the normal; the pulse was rather rapid, but not at all alarming. Suddenly, and before the bowels acted, the pain ceased, and at once I found the little girl in a decided collapse, the temperature quickly rising to

105, the pulse 180, and weak. The temperature soon remitted to 102, but there was not a corresponding improvement in the pulse. Under the free use of cardiac stimulants, there was temporary improvement, but nervous symptoms soon developed, passing from delirium, local spasm, and general convulsions, which repeatedly passed off and recurred to a short and fatal coma, death occurring just eighteen hours after the initial symptom. L. S. and A. S. made slow and tedious recoveries.

All of these cases were characterized by obstinate constipation, but there was no lead line present on the gums of any.

I had not been with my patient more than two hours before I strongly suspected poisoning, and on following up the symptoms and closely studying the other cases then sick, I soon became firmly convinced that the poisoning was produced by lead. Acting on this opinion, I at once dosed the entire family freely with epsom salts, as a chemical antidote, and then began a search for the source from which the poison was received. The culinary utensils were all right. The children had not eaten from metal plate. The water supply did not come in contact with any lead. There was no recent paint anywhere about the house. The deadly lead glazing of the confectioner was eliminated, and I could discover but one thing that aroused my suspicion in the least. The family had partaken frequently and the children had drank freely of the syrup from fruit and vegetables, which had been put up at home in tin cans, and the tin of which the cans were made had a peculiar blueish appearance, which was strongly suggestive of lead.

The family and family physician vigorously opposed my diagnosis, but I was so positive that I was right that I postmortemed the last case that died and made a solution from the stomach, which, through the courtesy of Dr. Steuart, Secretary State Board of Health, was submitted, together with a can of the suspected

fruit, to Prof. Tonry for chemical analysis, and I was much gratified to learn that the finding of the chemist supported my diagnosis.

EUGENE DOUGLASS, Ph. G., M. D.

Oxford, Md., July 1, 1893.

The cans, of which a list is appended hereto, were given me by Mrs. L. A. Skinner, of Royal Oak, Talbot county, Maryland. They were a portion of the cans she had purchased in which to can her fruits and vegetables for the season.

The fruit was all packed either by Mrs. Skinner or her mother. The cans were found in the yard and were known to be the cans used that winter, during the years 1892 and 1893. She purchased one supply of cans from E. T. Benson, of Royal Oak, and a later supply from S. Thompson, of the same place. Mr. Benson's cans were bought from Matthai, Ingram & Co. and Keen & Hagerty; and Mr. Thompson's were bought from C. H. Torsch & Co., all Baltimore firms.

The Matthai-Ingram Company's cans were known throughout the family's whole experience with them as a bad can. They always referred to it as such. They did not know it was a Matthai-Ingram can but identified it by the lettered top. It seemed to give dissatisfaction in the way fruit was kept in it.

I brought with me one full can of peaches in a can of Matthai, Ingram & Co., with the idea that, if necessary, we could test the contents of this can in order to ascertain whether it too contained lead in solution or whether this dissolved lead was peculiar to the fruit put up in the Matthai-Ingram can.

The only cans that can be positively identified are those known as the Matthai, Ingram & Company's cans, with the lettered top. The other cans cannot be identified, in my opinion, so far as the maker is concerned, but of course I am illegally incompetent for identification.

Can No. 1, from Mrs. L. A. Skinner, of Royal Oak, Talbot county, Maryland. July 1, 1893.
John M. Carter, Jr.

Can No. 2, from Mrs. L. A. Skinner, of Royal Oak, Talbot county, Maryland. July 1, 1893.
John M. Carter, Jr.

Can No. 3, from Mrs. L. A. Skinner, of Royal Oak, Talbot county, Maryland. July 1, 1893.
John M. Carter, Jr.

Can No. 4, from Mrs. L. A. Skinner, of Royal Oak, Talbot county, Maryland. July 1, 1893.
John M. Carter, Jr.

Can No. 5, from Mrs. L. A. Skinner, of Royal Oak, Talbot county, Maryland. July 1, 1893.
John M. Carter, Jr.

Can No. 6, from Mrs. L. A. Skinner, of Royal Oak, Talbot county, Maryland. July 1, 1893.
John M. Carter, Jr.

James A. Steuart, M. D.,
Secretary State Board of Health.

Dear Sir: The two accompanying analyses show the presence of lead in the liquid marked as coming from the contents of the stomach of Katie M. Skinner, and also in the canned tomatoes received at the same time. The canned tomatoes, when received, showed a very acid reaction, and as the coating of the can which contained the tomatoes contained lead in the tinning, the inference is that the tomatoes obtained the lead from the seventy-one square inches of the leaded tin surface of the can with which they were in contact. The corroded appearance of the inside surface of the accompanying pieces of the can which contained the tomatoes, strengthens this inference. The top of the can has—"Pat. Aug. 21, 1888"—stamped in it. There is no other mark in or about the can to indicate quality of tin or by whom made. The tin-cover of the can was fastened to the can itself by a

thin coating of wax. No putrefactive decomposition had taken place in the tomatoes when I opened the can, the contents were apparently in good condition.

The appearance of the inside of the can, the presence of an acid liquid in contact with the mixture of tin and lead forming the inside surface of the can, show that a local galvanic action was going on inside the can, with the resulting formation of a poisonous soluble salt. Whenever two metals come in contact with an acid solution of any kind, that contact on one of the metals, there will always be galvanic action. The presence of a strong mineral acid is not necessary; the presence of any of the weak acids found in fruits or vegetables is quite sufficient, and therefore, neither fruit or vegetables should ever be packed in cans, unless the surface of the cans is well covered with pure tin. In this case, the quality and quantity of the coating of the can are both objectionable. Neither fruit or vegetables that have been put up in tin cans, which, when opened, show a darkened or corroded inside surface should ever be used. In all articles put up for home use, the glass jar should always be given the preference to the tin can. Respectfully,

WM. P. TONRY.

BALTIMORE, June 10, 1893.

Sample—One quart can of tomatoes, received May 31, 1893, from James A. Steuart, M. D., Secretary State Board Health, marked, sent by Dr. J. M. H. Bateman, yields the following results:

The contents of the can—

Tin—5.62 grains.

Lead—2.54.

Iron—Amount not determined.

No copper, arsenic or antimony. The coating of the can is composed of tin and lead.

WM. P. TONRY, PH. D.,
Chemist.

BALTIMORE, June 10, 1893.

Sample—fz v., dark liquid in bottle, received May 31, 1893, from James A. Steuart, M. D., Secretary State Board of Health, marked: Suspected solution from stomach of Katie May Skinner, with nitric acid, yields the following results:

Iron—2.48 grains.

Lead—0.15 grains.

No copper, arsenic, antimony or tin present.

WM. P. TONRY, PH. D.,
Chemist.

BALTIMORE, September 22, 1893.

DR. JAMES A. STEUART,
Secretary State Board of Health, Baltimore.

MY DEAR SIR: I attach tabulated statements of analyses of materials used in the examination of the cause of the so called "lead poison" cases occurring in the family of Mrs. Skinner, Royal Oak, Talbot county, Maryland. With my report I return to you the reports of Dr. Wm. P. Tonry and Dr. Eugene Douglas.

Yours very truly,

W. B. D. PENNIMAN,
Analyst State Board Health.

Analytical Data.

TIN PLATES ANALYSES.							SOLDERS.		
Analysis.	Can.	Weight of plate per square inch.	Per cent. of tin.	Weight of tin per square inch.	Thickness of tin.	Per cent. compared with standard .000105.	Analysis.	Per cent. of lead in solders.	Maker of cans.
		Gme.	*Per cent.*	*Gme.*	*Inches.*	*Per cent.*		*Per cent.*	
1	1	1.3229	2.27	.03002983	.00012417	121.00	12	55.89	Unknown.
2	2	1.6161	1.31	.02117000	.0000875	85.00	13	59.94	M. I. & Co.
3	3	1.5217	1.91	.02906447	.00012017	117.00	14	53.03	Unknown.
4	4	1.6932	1.79	.03030828	.0001254	122.00	15	60.61	M. I. & Co.
5	5	1.6288	1.44	.02345472	.00009697	94.70	16	60.60	M. I. & Co.
6	6	1.4065	1.035	.01455831	.000060198	58.70	17	52.88	Unknown.
6 A	6 A	1.4774	1.12	01654688	.00006842	66.80	....	.....	Unknown.
7	7	1.5024	1.62	.0243888	.000100845	98.20	...	.....	M. I. & Co.
8	8	1.3778	1.54	.0212182	.000087725	85.40	...	.....	Unknown.
9	9	1.2762	1.60	.0204192	.000084425	82.40	18	61.10	M. I. & Co.
10	10	0.9707	2.81	.02727967	.0001128	110.00	....	.....	Unknown.
11	11	1.3390	2.89	.0386971	.0001601	156.00	19	57.29	Unknown.

EXPLANATORY NOTES TO ANALYTICAL DATA.

Cans Nos. 1, 3 and 6 are domestic cans, maker unknown.

Cans Nos. 2, 4 and 5 are domestic cans, made by Matthai, Ingram & Co

Can No. 6 is can that contained the peaches, maker unknown.

Can No. 6 A is top of can 6.

Can No. 7 is can that contained tomatoes, made by Matthai, Ingram & Co. This is the can analyzed by Dr. Wm. P. Tonry.

Can No. 8 is top of can No. 7.

All the above are from Mrs. Skinner.

Can No. 9 is a new can made by Matthai, Ingram & Co.

Can No. 11 is a can containing tomatoes bought in the open market.

Can No. 10 is top of can No. 9.

Results of Analyses of Contents of Cans.

	Can No. 7. W. P. Tonry's analysis.	Can No. 6. W. B. D. P.	Can No. 11. W. B. D. P.	Can No. 12. normal Tomatoes. W. B. D. P.	Can No. 6. Syrup of Peaches. W. B. D. P.
Contents of can, grams	.....	548.8	1063.2	.....	
Contents of can, grains	1 quart.	8451.52	16373.28	.....	
Percentage of acidity	.....	0.5303	0.701	0.3827	
Weight of acid, as acetic	.....	2.9086	7.453	.....	
Weight of tin, grams	.....	0.1271	0.14587	.....	3.045 to 6 tablespoons.
Weight of tin, grains	5.62	1.9573	2.2464	.....	0.689 to 6 tablespoons.
Percentage of tin	.....	0.02316	0.01372	.....	
Weight of lead, grains	2.54	none	none	.....	
Weight of ash, grams	.....	0.3643	0.9573	.....	
Percentage of ash, grains	.....	0.0664	0.009004	.....	
Percentage of ash, grams	.....	0.0664	0.009004	.....	
Percentage of iron	.....	0.00554	.....	.....	
Weight of iron, grams	.....	0.0304	.....	.....	

Can No. 6 contained peaches. Can No. 7 contained tomatoes. Cans Nos. 11 and 12 tomatoes.

REPORT.

Before considering the results of the analyses of the contents of various cans which were examined, I would call your attention to the following extracts from a report of the United States Department of Agriculture on the subject. (Canned vegetables, Bulletin 13, part eight, page 1035.)

"Metallic tin placed in a weakly acid solution containing a small amount of lead throws down the latter in the metallic form, becoming itself oxidised. Similarly, if an alloy of lead and tin, containing a small amount of lead, is exposed to such an acid solution the tin dissolves first. This play of affinities does not hold good in the case of alloys containing large amounts of lead, such as solders."

(Again page 1040). "The relative quantities of the two metals in solution will depend partly upon the nature of the food and partly upon the relative quantities of metallic lead and tin exposed to the action of the food."

In all the tin plates examined (12), I did not find one that contained lead, so I have no hesitation, in saying that lead did not proceed from this tin plate.

The only other possible source is the solder, which has between 50 per cent. and 60 per cent. of lead (see solder analyses). I examined first the soldering of the cans received from Mrs. Skinner, and visiting a large dealer in domestic goods, I looked over very carefully the different kinds offered for sale. In every case the cans were what is known as "outside soldered," *i. e.*, the various pieces making up the can are lapped and the soldering done from the outside, very rarely a small part of the solder had leaked through and was found in the inside of the can. Even in these cases the "relative quantities of metallic tin and lead exposed to the action of the food," would prevent any lead from going into solution. The area of tin exposed

being about seventy-five (75) square inches, and the solder exposed certainly not more than one quarter ($\frac{1}{4}$) of one square inch, for this reason, though the solder contains a large proportion of lead, so little can be in contact with the food that contamination cannot be said to be due to it.

Dr. Tonry reports that, in his opinion, the cause of death of Mrs. Skinner's children was poisoning by lead. From the above considerations alone, I would be compelled to doubt the correctness of Dr. Tonry's conclusions. I have tested very carefully the piece of tin can and the top of the same (analyses 7 and 8), which were analysed by Dr. Tonry and reported as being coated with lead and tin. As I find no lead in these, I cannot concur with Dr. Tonry in his "inference that the tomatoes obtained the lead from the seventy-one square inches of leaded-tin surface with which they were in contact."

Furthermore, having examined the quality of the tin plate of seven cans used by Mrs. Skinner, and finding them all free from lead, I analysed the contents (peaches) of the can No. 6, received from Mrs. Skinner, and think that the results obtained are much more important than the examination of the tomatoes.

Dr. Eugene Douglas, in his pathological report, says: "The family had partaken frequently and the children had *drunk freely* of the *syrup* of *fruit* and vegetables, which had been put up at home in tin cans."

It is not probable that the children (who were in every case the ones poisoned) drank the "syrup" of tomatoes, and it is probable that they did drink the syrup of canned peaches.

I found that the peaches were soured; in fact, scarcely eatable. They were tested, however, to study the action of an *extreme case;* that is to say, if lead were ordinarily present in the fruits and vegetables packed in Mrs. Skinner's household, surely we would find it in the peaches containing a large portion of acidity. Not

a trace of lead was found, but considerable quantity of tin.

Proceeding on the theory that the poison was administered to the children in the syrup of peaches, or similar fruit, I then examined six (6) tablespoons of the juice from the canned peaches, to ascertain if the quantity of tin present could have been the cause of these deaths. I find, in the quantity of syrup above mentioned (6 tablespoons), that there is 0.689 grains (.045 grams) of tin present. This tin is present as a soluble salt in the syrup; we know this, as the syrup was *filtered* from the fruit.

I have been to very great pains to look up the literature on this subject, and find there is very little of any value published, which bears directly on this particular case. From some experiments reported by O. Hehner (analyst, 1880, 5,218) and the discussion which follows, the following facts are drawn:

First. Finely divided tin or an insoluble salt of tin is not very dangerous to health, as it is not absorbed into the system.

Second. When the tin administered, as was true in this case, is a soluble salt of tin, the physiological effects are very marked; very small doses acting as a poison, death being "apparently due to the astringent and irritant action of the metal."

Emil Ungar and Guido Bedlander (Ztch. Hyg., 1887, 2.241) conclude as the result of experiments upon the toxicity of tin salts, "that even minimal doses of tin when frequently repeated destroy health and finally cause death."

Being called into this case too late to have an opportunity to examine the viscera of the child, and wishing to ascertain if the analyses of tomatoes made by Dr. Tonry was more instructive than the one of peaches made by myself, I bought a sample of tomatoes in slightly spoiled condition, and another can of the same packing in good condition, to ascertain in the first place what would be the increase of acidity, and,

second, to know if the acids from tomatoes acted differently from the acids in the vegetables reported by the Agricultural Department.

The amount of soluble tin I found in the syrup of peaches is sufficient in quantity to act as a poison upon children, if the doses are repeated at short intervals, and probably even one dose would have a very dangerous and perhaps fatal effect.

I therefore conclude as the results of my own personal work, and the consideration of the experiments noted above, that the cause of death was probably tin, and this supposition bears out the report of symptoms made by Dr. E. Douglas (see pathological report).

The question that arises is, were the cans the source of the trouble, or was the fault due to careless canning allowing the fruit to sour?

You will see in the examination I have made of the tin plate used by Mrs. Skinner, that I have calculated the thickness of the tin on the iron and taking the average thickness of several samples of undeniable good quality, I find that the iron was well coated with pun tin.

The percentage of lead, in the solder used, is in every case very high, and, though, for the reasons indicated in the first part of this report, I do not think there is any great danger from this source, still lead being a more dangerous poison than any other common metal, every precaution should be taken to prevent its introduction into articles of food.

There is an objection to the ordinary sealing of home-packed vegetables by a waxed string; and that is, from the difficulty of making a perfectly tight joint. Of course, if the joint is not perfectly sealed from the air, fermentation and decomposition will set in, resulting in the formation of acids, which act upon the tin and eventually upon the lead, if any be present.

In ordinary cases the amount of tin or lead introduced into the system in this way is not sufficient to cause trouble, or at most, only a slight sickness, but

care should always be taken in the sealing of the cans, and no vegetable should be used in which there is any signs of spoiling.

In the case of steam-packed goods this danger is easily avoided, as putrefaction changes are readily detected by the bulging of the tops of the cans.

Canned fruits and vegetables are so useful and important articles of food that the very slight possible risk of their contamination, when properly packed, need not interfere with their consumption.

Cases will occur, however, from time to time, where improperly packed material will be put upon the market, with greater or less danger to the general public.

I would respectfully suggest that it would be advisable, for the protection of all concerned, that the quality of the tin plate and of the solder should be regulated by the proper authorities.

Very truly yours,

W. B. D. PENNIMAN,

Analyst.

MILK.

BALTIMORE, June 16, 1893.

DR. JAMES A. STEUART,

Secretary State Board of Health, Baltimore.

MY DEAR SIR: Enclosed please find analyses of milk from various sources. All of these are of good quality but the one from Farmland dairy. Some of these, however, are very near the very low standard adopted in New York State. The general character of the milk supply is, however, very satisfactory, if it is all as good as supplied by these dairies, which are the larger ones in the city. I fear that we will find, if we turn our attention to the smaller concerns, which, in the aggregate, furnish the largest proportion of the milk supplied that we will find the quality much worse. This has been the experience of those cities that have gone into the subject extensively.

We may congratulate ourselves that so far none of the samples have shown that such preservatives as salicylic or boracic acid are in use. This dangerous custom has been the source of a great deal of trouble in other cities. Yours very truly.

W. B. D. PENNIMAN,
Analyst.

BALTIMORE, June 16, 1893.

DR. JAMES A. STEUART,
Secretary State Board of Health,
1611 *John Street, Baltimore, Md.*

MY DEAR SIR: Attached please find analysis of milk, sampled June 12th by myself, acting as inspector.

If we adopt for the time being the standard of the New York authorities, which is as follows:

Fat	2.5	per cent..
Solids not fat	9.0	"
Total solids	11.5	"
Water not above	88.5	"

We find that only one of these milks should be absolutely condemned, viz.: that of the Olive Dairy. Several of the others are very close to the limits. None of the samples contained deleterious or poisonous substances, used as preservative.

Very truly yours,
W. B. D. PENNIMAN,
Analyst.

BALTIMORE, June 28, 1893.

DR. JAMES A. STEUART,
Secretary State Board of Health, Baltimore.

MY DEAR SIR: Attached please find analyses of milk, samples Nos. 25 to 28 inclusive. As you will note, two of these dairies are systematically supplying very poor milk; unquestionably adulterated. These two dairies are the Monrovia Farm and Olive. The Farmland supply should be examined from time to time, as they

have several times fallen below standard. I attach statement of expenses.

Very truly yours,

W. B. D. PENNIMAN,
Analyst.

Samples 1 to 10, inclusive, drawn June 16, 1893.

Source of Sample.	Ashland Dairy.	Waverly Dairy.	Owings' Mills Dairy.	Cedar Brook Dairy.	Jersey Dairy.	Farmlands Dairy.	Woodbrook Dairy.	Greenwood Dairy.	Aldenary Dairy.	Western Maryland Dairy.
Specific gravity	1.030	1.031	1.031	1.031	1.031	1.035	1.031	1.030	1.031	1.030
Total solids, per cent.	12.55	12.60	13.10	13.2	12.45	10.9	12.9	12.8	15.05	14.8
Water, per cent	87.45	87.41	86.90	86.8	88.55	89.1	87.1	87.2	84.95	85.2
Solids, not fat, pr. ct.	8.35	9.00	9.30	9.1	8.65	8.9	9.0	7.9	10.65	9.9
Fat, per cent	4.2	3.60	3.80	4.1	3.8	2.0	3.9	4.9	4.40	4.9
Ash, per cent	.67	.93	.84	.76	.825	.75	.67	.62	.79	.84
Quality.....	good	good	good	very good	good	bad	very good	very good	very good	very good
No. of sample.	1	2	3	4	5	6	7	8	9	10

MILK—Continued.

Samples 11 to 19, inclusive, drawn June 16, 1893.

Source of Sample.	Blind Asylum Dairy.	University of Md. Hospital.	Melrose Dairy.	Pennsylvania Dairy	Fallston Farm Dairy.	Pikesville Dairy.	Spring Lake Dairy. Wagon No. 7.	Spring Lake Dairy.	Wester Ogle Dairy Wagon No. 4.
Specific gravity	1.030	1.031	1.034	1.030	1.035	1.035	1.031	1.031	1.032
Total solids, per cent	14.05	17.1	12.0	12.6	15.3	12.2	12.4	11.42	11.6
Water, per cent.	85.95	82.9	88.0	87.4	84.7	87.8	87.6	88.58	88.4
Solids, not fat, per cent	9.65	8.7	9.5	9.0	10.1	9.1	8.6	7.72	7.8
Fat, per cent	4.40	8.4	2.5	3.6	5.2	3.1	3.8	3.70	3.8
Ash, per cent	.73	.99	1.01	.77	.75	.96	.86	.82	.87
Quality	very good	very good	fair	very good	very good	good	very good	very good	very good
No. of sample	11	12	13	14	15	16	17	18	19

MILK—Continued.

Samples 20 to 24, inclusive, drawn June 16, 1893—Samples 25 to 28, inclusive, drawn June 28, 1893.

Source of Sample.	Olive Dairy.	Windsor Farm Dairy.	Lafayette Dairy.	Monrovia Farm Dairy.	Wester Ogle Dairy.	Monrovia Farm Dairy.	Olive Dairy.	Farmlands Dairy.	Farmlands Dairy.
Specific gravity	1.033	1.032	1.031	1.028	.....	1.034	1.033	1.031	1.033
Total solids, per cent	18.2	11 0	12.2	11.45	18.6	9.45	9.57	10.86	13.00
Water, per cent	81.8	89.0	87.8	88.55	81.4	90.55	90.43	89.14	87.00
Solids, not fat, per cent	16.0	8.2	8.8	8.75	6.3	7.65	8.37	7.71	9.60
Fat, per cent	2.2	2.8	3.4	2.7	12.2	1.9	1.2	3.1	3.4
Ash, per cent	1.4	.81	.87	1.83	.70	.51	.94	.76	.8
Quality	bad	fair	very good	fair	evidently cream	bad	bad	bad	good
No. of sample	20	21	22	23	24	25	26	27	28

ICE.

BALTIMORE, July 21, 1893.

DR. JAMES A. STEUART,
Secretary State Board of Health.

MY DEAR SIR: I attach statement of analyses of ice. These analyses show that Baltimore's supply of ice is of excellent quality.

Yours truly,
W. B. D. PENNIMAN,
Analyst.

BALTIMORE, July 21, 1893.

DR. JAMES A. STEUART,
Secretary State Board of Health.

MY DEAR SIR: I attach an analysis of ice from the Maryland Ice Company. If the water is distilled before being frozen, of course there is no danger from its use. This, I know, is what is claimed by the manufacturers, but the fact that there is so much material in solution makes it appear doubtful that such is the case. I think that it would be well for us to inspect some of these ice factories. I will confer with you about this in the near future.

Yours very truly,
W. B. D. PENNIMAN.

Natural Ice Supplied to Baltimore.

Source.	*Maryland Ice Company.	Biemiller Ice Company.	Consumers Ice Company.	Sumwalt Ice Company.	Cochran-Oler Ice Company.	Susquehanna Ice Company.	Kennebec Ice Company.	Susquehanna Ice Company.
Color	none	none	none	none	none	none	none	none
Odor	none	none	none	none	none	none	none	none
Reaction	neutral	neutral	neutral	neutral	neutral	neutral	neutral	neutral
Total solids	38.	25.	25.	22.	20.	20.	23.	40.
Inorganic solids	34.	24.	23.	21.	20.	19.	22.	38.
Organic solids	4.	1.	2.	1.	.....	1.	1.	2.
Amount of chlorine	5.8	1.42	1.42	1.9	1.42	1.42	1.9	1.9
Free ammonia	.15	none	none	none	none	none	none	none
Albumenoid ammonia	.08	.08	.05	.06	.04	.08	.08	.05
Amount of nitrates	none	none	none	none	none	none	none	none
Amount of nitrites	none	none	none	none	none	none	none	none
Condition	good	good	good	good	good	good	good	good

*These ices are all natural ices, with the exception of the Maryland Ice Company.

FINANCIAL STATEMENT FOR BALANCE OF FISCAL YEAR, FROM MAY 1 TO SEPTEMBER 30, 1893.

May 1.	Balance of appropriation for food and drink Inspections and analyses	$1,633 96
Sept. 30.	Expended for this account up to date	1,633 92
Sept. 30.	Balance remaining	04
May 1.	Balance of appropriation for general expenses	$594 32
Sept. 30.	Amount expended to date on this account	311 43
Sept. 30.	Balance remaining	$282 89
May. 1.	Balance on salary account of Secretary	$825 00
Sept. 30.	Amount drawn by Secretary on this account	750 00
Sept. 30.	Balance unexpended	$75 00
	Total balance	$357 93

JAMES A. STEUART, M. D.,
Secretary and Executive Officer.

The President of the Board adds the following to the tenth biennial report of the State Board of Health of Maryland:

To the Governor and General Assembly of the State of Maryland:

In obedience to the Act of eighteen hundred and eighty (1880), entitled: "An Act to Establish a State Board of Health," which requires that the report of the Secretary shall be submitted at each regular session of the Legislature, the President of the State Board begs leave, with the presentation of said report, to add some suggestions for the future sanitary welfare of the State.

Owing to the resignation of Dr. Chancellor, the former Secretary, and Dr. Piper, President of the Board, several changes were rendered necessary in the personel of the Board.

The careful attention of the Secretary to the water supply of the city of Baltimore is particularly noteworthy, and, if continued in the future, as no doubt it

will be, must afford security to the health of the citizens. The course that the Secretary has pursued in visiting the different counties in the State, and meeting and communicating with the various health boards and medical men of these counties, must lead to the most beneficial results in co-operating with the State Board in all measures pertaining to the general health of the State. The counties of Maryland have heretofore been very remiss in matters pertaining to sanitation in their different localities, but the interest that has been manifested recently through the visits of Secretary Steuart gives promise of better things and immunity from future visitations of disease due to local causes. The State Board must rely upon the local authorities for information, advice and assistance to make its work effective.

Some additional legislation may possibly be required to fully secure the public health in the City of Baltimore. The "sweating" system, which obtains to a certain extent in that city, has been the cause of some agitation on the part of the citizens, and has led to the appointment of committees to bring about a reformation in this system. A law has been passed by the Legislature of Massachusetts providing that "sweat shops" shall be licensed and superintended by the police, and that in cases of danger from infectious diseases or vermin, the State Board of Health shall take charge and control. If a law of this kind were passed by the Legislature of our State it would meet with general acceptance on the part of the citizens of Baltimore.

At a meeting of the International Congress of Public Health, held under the auspices of the American Public Health Association and the World's Congress Auxiliary of the World's Columbian Exposition, at Chicago, October 10, 14, 1893, in which congress the State Board of Health of Maryland was represented by its President, the following resolutions were adopted by general consent:

Resolved, First—That the educational authorities of the various nations represented here be requested to devote a longer time than they now do in curriculum to the teaching of hygiene. 2d. That the governments of the countries represented at this congress be urged to appoint to sanitary positions and commissions only such persons as may have acquired a special education in sanitary studies.

Resolved, That the International Congress of Public Health affirms in the strongest possible manner its confidence in the value of vaccination as a preventive of small-pox.

Resolved, That this Congress urge upon the people of the countries here represented the importance of completing our sanitary organization by forming voluntary public health associations to study for themselves the conditions of healthy living in the home and the community, and to afford efficient and persistent support to the work of public health officials; that this Congress respectfully ask State and local boards of health to assist in all proper ways the formation of such organizations.

This action on the part of the International Public Health Congress meets with the earnest approval of our State Board, and its members will individually and in their public capacity urge its acceptance by the whole people of the State.

Very respectfully,

JOHN MORRIS,

President.

Quarterly report of C. W. Chancellor, M. D., late Secretary and Executive Officer of the State Board of Health of Maryland, for the quarter ending, March 31, 1893.

It is a matter of congratulation that during the past year the State has not been visited with any widespread cause of mortality or sickness. Several outbreaks of typhoid fever and cerebro spinal meningitis, in various parts of Western Maryland, have been speedily checked; not, however, without a waste of life which ought not to have taken place. It is to be regretted that so much apathy exists in certain localities where typhoid fever prevails almost perennially. Surely the time has come when this state of affairs ought to be remedied, and when it should be competent for the State Board of Health to see that efficient action, in all necessary cases, is taken where the local authorities are in default or inactive. A town will allow a serious disease to be prevalent in it for months without appearing to be impressed by the fact: and if a report, by any chance, reaches the outside public, indignant protestations of innocence are immediately published, and emphatic denials at once issued. In this there is the unworthy motive of supporting the credit of the place at the expense of the health and lives of the people.

We have not suffered, and are never likely to suffer, from an imported plague, like Asiatic Cholera, as we do every year from those that are less virulent, but endemic. The victims of typhoid fever, diphtheria, scarlet fever and consumption are many times more numerous in America than the victims of diseases brought from Europe or the Ganges, and it must be remembered that all these disorders, those we are familiar with not less than those that come from abroad, are produced in identically the same way—by the introduction into the system, generally through the mouth,

of a specific, organic, infective poison, conveyed by water or food, or carried in particles of atmospheric dust.

It should be constantly borne in mind that the same local peculiarities which cause typhoid fever and diphtheria will also cause cholera, and no locality that suffers from the former can hope to escape the latter should it prevail in this country. It is best, therefore, that the fullest possible information be given concerning all conditions which have probably caused typhoid fever and other zymotic diseases in any particular locality, since it will then be possible for efficient measures to be taken to prevent the more terrible scourge of cholera.

As there is every probability that before many months we will have cholera again knocking at our doors, it may not be amiss to refer in this report to some of the more important factors in the causation of the disease, and the necessary preparations to successfully combat it. These precautions should extend to the country as well as the city, for should the disease appear in a village or rural district near the city, and proper measures are not taken to prevent its spread, there is great probability of its being communicated to the city, principally through defilement of the sources of food and water supplies.

RELATIONSHIP OF CHOLERA AND TYPHOID FEVER WITH A CONTAMINATED WATER SUPPLY.

We must rehearse the same old story of carelessness and neglect respecting the water supplies of our cities and towns, and the fearful effects that may result therefrom. It is hard to see how local authorities, entrusted with the solemn duty of protecting their respective communities against infectious diseases, can, under the circumstances of an outbreak of such diseases, avoid being self-convicted of criminal carelessness. If local authorities in such cases have no con-

science, they should be held to a defense for heavy damages in every case of sickness or death caused by their neglect. The "old oaken bucket" still holds a place in the affections of the people of most villages, but this idol must be shattered in order to secure the inhabitants against the infection of both typhoid fever and cholera. There can be no doubt of the fact that cholera allies itself very much to the method of transmission of typhoid fever through drinking water, and wherever one disease prevails the other is likely to occur.

At Ashabad, Turkestan, where typhoid usually prevails, the governor of the town gave a fete in August, 1892, to celebrate the absence of cholera from the place, which was numerously attended. Of the many guests who were present, one-half died within twenty-four hours thereafter; and within forty-eight hours 1,300 people, or 10 per cent. of the entire population, had died with cholera. On the day previous to the appearance of the disease a very heavy rain storm had occurred, which swept refuse and other matter from a small village above, where cholera had prevailed, into the stream that supplied Ashabad with water, and this matter was carried with the water supply into the city and distributed to the people, with the result above stated. Nor is this an isolated case. It is notorious that the English officials in India, and those belonging to the English army there, having good water and good sanitary regulations, are, as a rule, not susceptible to the cholera, though it might be expected that these unacclimated classes would suffer from it more than the natives. Could any stronger point be made as to the value of a pure water supply, in its bearing upon the public health, than the cases cited above?

The lesson to be learned from the epidemic at Ashabad, is that a single case of cholera occurring in any village or farmhouse on the water-shed of Lake Roland or Loch Raven is liable to occasion an epidemic in

Baltimore. The utmost vigilance, therefore, should be exercised at all times over the entire water-shed; but, above all, the more certain protection afforded by a thorough filtration of the entire water supply of the city, through some efficient purifying medium, before it enters the distributing mains, ought to be instituted at once. It is generally conceded that the epidemic of cholera, which caused 7,611 deaths in Hamburg and 502 deaths in Altona, Germany, last summer, was greatly intensified, if not positively occasioned, by the use of foul, unfiltered water from the River Elbe. With an irreproachable water supply, an epidemic of either typhoid fever or cholera is next to impossible; but as long as our authorities shut their eyes to the fact that impure water is the great and almost only cause of these diseases, so long will they continue to bear the heavy responsibility of the appearance of such diseases in epidemic form.

NURSERIES OF DISEASE GERMS.

Filth stored up in vaults and cesspools is one of the greatest dangers to health, as it is one of the most common. It is an evil that produces disease and death in both city and country—a veritable hot-bed of infection. Should an ingenious enemy of mankind endeavor to construct a system of nurseries for disease germs, no better method than these receptacles could be devised, especially for the germs of typhoid fever and cholera, which not only originate and multiply in such places, but are preserved for years, ready to produce their pathogenic effect at any time that chance may send them percolating through the soil into some adjacent water supply. The late Sir Robert Rowlinson, in discussing the causes of cholera, thus speaks of vaults and cesspools: "These foul places are the true seed-beds of cholera, and woe be to the inhabitants of towns and villages so encumbered if cholera be introduced, for it will rage as the fire rages among heaps of dry combustibles."

I submit with this, reports on the epidemic of cerebro spinal meningitis in Lonaconing.

BALTIMORE, March 31, 1893.

FINANCIAL STATEMENT.

Appropriation for the fiscal year ending October 1, 1893	$1,200 00
Expenditures from September, 1892, to April 1, 1893, as per vouchers filed with Comptroller	484 75
Balance	$715 25

October, 1892.	By draft to Dr. J. M. H. Bateman for traveling expenses	$10 00
Jan'y 6, 1893.	By draft to Dr. Jackson Piper, for traveling expenses	15 00
		$25 00

BALTIMORE, March 31, 1893.

FINANCIAL STATEMENT.

DEPARTMENT OF FOOD AND DRINKS INSPECTION.

Appropriation for fiscal year ending October 1, 1893	$2,400 00
Expenditures from September, 1892, to April 1, 1893, as per vouchers filed with Comptroller	979 75
Balance	$1,420 25

FOOD ADULTERATION.

It is gratifying to report that the percentage of adulteration detected has steadily diminished. The greater portion of adulterated samples examined came from Eastern cities or manufactories, who can be reached only through the retailers.

BAKING POWDERS.

The weight of evidence on alum in baking powders is still in favor of the opinion that it is not a desirable component for baking powders. The following brands have been found to contain alum :

Silver Star,	Continental,
Ne Plus Ultra,	International,
Eureka,	Gem,
Enterprise,	Crystal,
Sovereign,	Puritan,
A. & P.,	Windsor,
Silver King,	Albany Favorite.

Alum is the only substance used in the manufacture of baking powders that can be considered deleterious.

COCOA AND CHOCOLATE.

All the samples of cocoa and chocolate examined proved to be good.

COFFEE.

Fifteen samples of coffee examined proved, with only three exceptions, to be good, and these three contained very little real coffee, the compound consisting of roasted peas, rye or wheat, with or without chicory.

SUGAR.

The only substance used in adulterating the samples of sugar examined was, in one sample, sand, and in another "ultra marine," found in two samples to improve the appearance of the sugar. All the brown sugars examined, except in the one case where sand had been used, were found to be genuine.

MAPLE SUGAR.

Of five samples two were found to be adulterated and three genuine. The articles used for adulteration were molases and gluecose.

HONEY.

Honey is proverbially more extensively adulterated than any other article. The proportion of adulteration has been found to be fully 95 per cent. of all the

strained honey sold, all containing glucose in varying amounts. Honey in the comb is the only kind that can be relied upon for purity, and now the comb has been imitated and the cells filled with fraudulent material.

CANNED GOODS—MEAT EXTRACTS.

Meat extracts are not subject to adulteration; but according to Prof. Wood they are not food in the ordinary acceptation of the term, but belong rather to the class of stimulants, and their value is chiefly in the sick room.

The following is the analysis of five different meat extracts:

1. DE LACLARE'S EXTRACT OF BEEF.

Water	20.26 per cent.
Organic matter	60.50 "
Alcoholic extract	56.13 "
Ash	19.24 "

2. JOHNSON'S FLUID BEEF.

Water	49.54 per cent.
Organic matter	47.16 "
Alcoholic extract	20.30 "
Ash	3.30 "

3. VALENTINE'S MEAT JUICE.

Water	66.29 per cent.
Organic matter	22.62 "
Alcoholic extract	28.67 "
Ash	11.09 "

4. MURDOCK'S LIQUID FOOD.

Water	83.13 per cent.
Organic matter	16.45 "
Alcoholic extract	11.97 "
Albumen	14.10 "
Ash	0.42 "

5. LIEBIG'S EXTRACT.

Water	24.10 per cent.
Organic matter	52.16 "
Alcoholic extract	54.87 "
Ash	23.74 "

Numbers 1 and 5 are true meat extracts; No. 4 is not an extract but a preparation of beef or other blood.

MUSTARD.

Mustard is almost uniformly compounded or adulterated. The adulterants employed are chiefly flour and termeric, with sometimes a little cayenne.

PICKLES.

No sample of pickles examined were found to contain anything injurious.

VINEGAR.

Generally quite pure; as frequently above as below the standard of 4½ per cent. acetic acid. No mineral acid detected.

MOLASSES.

Molasses has been found to be bleached with chloride of tin, which, "when added in solution to low grades of molasses, unites with the coloring matter to form an insoluble compound, which is precipitated, and a lighter-colored molasses, of apparently higher grade, is the result." As the salts of tin are all poisonous, the practice is doubly reprehensible.

MILK.

The consideration of milk, as a most important article of diet for persons of all ages, has, only of late years, forced itself upon the attention of writers on dietetics. Ordinary milk contains—

Water	87.55	per cent.
Fat	3.08	"
Casein	4.04	"
Milk sugar	4.62	"
Ash	0.71	"
	100.00	"

Milk contains in most beautiful combination all the substances necessary to perfectly nourish an infant. But if the milk used is below the normal standard, the

child is half starved; if richer than usual, it is overfed and suffers accordingly. Good milk ought not to contain of solids less than 12 per cent.

OTHER ARTICLES.

Fully fifty per cent. of the following articles were found to be adulterated: Ginger, white and black pepper, mace, cassia, cloves, cayenne and horse-radish. The following were genuine: Buckwheat, tapioca, cracked oats, sage, citron and table salt.

INSPECTION OF MILK.

Tests have been made of a large number of samples of milk, and it has been found that since the inspecting begun the quality of the milk sold in the city has greatly improved. The mean of density may be stated at about 1031.50, and the mean of butter at 2.95, which is a fair average. In no case was the minimum of density found to be less than 1023.86, or the minimum of butter less than 1.79. Under the above circumstances there has been no occasion to appeal to the grand jury to indict delinquents for infractions of the law.

It is very evident that the inspections begun three years ago have resulted in an increased percentage of butter in the milk, and it must be admitted that this is probably the most important element to preserve and the one the most frequently removed. It is also to be remarked that the number of samples having a density of less than 1029 has greatly diminished. It is a matter of fact that the number of milkmen resident in the city has diminished in the last two or three years, and there has been a proportionate increase in the number who have taken up their residence in suburban localities. This movement cannot be too highly praised, for there is in it a double advantage of economy and healthfulness.

The sending of milk from the country every morning to milkmen who distribute it to the different families

comprising their customers is largely practiced. The amount of milk imported in this way annually is almost three times as great as formerly.

The State and City Boards of Health should endeavor to diminish the number of cows in the city in order to prevent nuisance, and to supply the animals with air more suitable to their health, and to thus effect an improvement in the quality of the milk they supply.

In his capacity as meat inspector, Mr. G. Robert Godman has confiscated and destroyed a number of cattle which were suffering from actinomycosis (lumpy jaw) and osteosarcoma. A much larger appropriation would be required to carry out properly the inspection of the food act. It has been extended to several of the towns outside of Baltimore, but no systematic inspection could be kept up for want of money to pay the necessary expenses.

COW STABLES.

Improvements are required in many cow-stables in and around the city, such as putting in ventilators, making windows, laying drains and greater attention to cleanliness generally. The Inspector of the Board has made inquiry concerning the sanitary condition of many stables, and his report is herewith transmitted.

UNSOUND FOOD.

Large quantities of meat, vegetables, fruit and other unsound and unhealthful foods have been condemned and destroyed, without the necessity of harsh measures being used.

To Dr. Charles W. Chancellor,
Secretary State Board of Health.

Sir: In compliance with your request we beg to submit the following report of our investigations in connection with the epidemic of cerebro spinal meningitis which has prevailed for some time past and is still prevailing in Lonaconing, Maryland, and in neighboring places in the George's Creek Valley.

Thanks to your introduction we were, by the courtesy of the local medical men, afforded every facility for a full study of the disease, and we wish here to express our gratitude especially to Drs. ..... Skilling, W. Q. Skilling, ... Porter, ... Porter, and J. O. Bullock, of Lonaconing, and Dr. A. G. Smith, of Ocean, Md., for valuable assistance and many kindnesses.

The town of Lonaconing is a mining centre in Alleghany county and contains less than 1,000 inhabitants. The location is peculiar and is of interest from an epidemiological standpoint. The town is situated in a narrow valley and extends well up the sides of the steep hills which enclose it. Through the bottom of the gulch runs a muddy stream known as George's creek. The mountains rise more or less abruptly from the edges of the creek, and the town may for our purpose be divided into two parts; first, that lying in the valley in which the business portion and the dwellings for the most part of the professional and business men of the place are situated; and, second, that built on the mountain sides consisting almost entirely of miners' dwellings. The stream and valley are somewhat tortuous at this spot and give the place the appearance of being surrounded on all sides by mountains. One is struck almost at once by the arrangement of the houses on the incline. They are placed in long rows, tier above tier, facing the valley; behind, and therefore above the houses are situated the privies placed flat upon the ground, and not infrequently a cow stable is located quite close to a dwelling. Before our arrival

at Lonaconing there had been a heavy snowfall, but while there the weather became mild, the snow melted and exposed to view and made doubly striking by contrast the dreadful conditions which obtain.

The water streaming down the mountain sides and carrying with it the general refuse from the yards, the material from the cow-stables, and the excreta from the out-houses of the upper tiers, through the yards, past the dwellings situated below, finally entered the creek which acts as a huge sewer winding through the centre of the town. On their way these polluted surface washings finding no system of drains for their reception, not infrequently crossed the common roadway, in little rivulets, through which the inhabitants had to drive and walk.

The water supply of Lonaconing is derived partly from surface wells and partly from cisterns, and we were able to demonstrate during the thaw the entrance of surface water and its accompanying filth directly into wells which were in daily use for drinking and culinary purposes.

Significant too is the fact that in the valley the wells are situated often only a few feet from the creek, and it is certainly not hard to believe that the contaminated water from the creek could soak through the soil and mix with the water of the wells.

The slaughter-houses are in the heart of the town, upon the banks of the creek, and the blood and waste material from these find their way into its waters. These unsanitary conditions are not confined to Lonaconing alone, but in its course George's creek, passes through a number of small towns, each of which adds its quota to the general filth, and only a few days ago an investigating party inspecting the river between Westernport and the Phoenix mines is said to have found dead horses in the stream and others lying along its banks.

The population of Lonaconing is chiefly made up of coal-miners and their families. In many instances

there was distinct evidence of over-crowding, as many as eight and ten individuals living, eating and sleeping in a house of four small rooms. The individual houses in the long rows on the hill-side are built so close to one another that often there is scarcely room for a foot-path between them. There were, however, among them, many well-built and commodious houses, and as we shall show later, the occupants of these were by no means immune from the disease.

From what we have said it will be obvious, that whether or not cerebro-spinal meningitis is a filth disease, Lonaconing and the other towns situated along the banks of George's creek are, and have been for years, in about as shocking a sanitary condition as could be well imagined, and it would be little wonder if typhoid fever, diphtheria, dysentery, and the whole group of filth diseases, should find in them an endemic home.

By far the greater number of the cases of meningitis occurred in the higher portion of the town, and they were usually found confined to little foci or groups of houses. To this rule, however, there were numerous exceptions. A few of the patients lived close upon the margin of the creek, and isolated cases of the disease were by no means rare. One boy, who died on the ninth day of the disease, lived on Jackson hill, fully a quarter of a mile from any other habitation, and of the patients at Ocean none lived more than thirty feet above the level of the creek.

The earliest cases of which we have notes occurred during the first week in January, 1893. During the course of a dance, two young men, who overheated themselves, imprudently rushed into the open air to get cool. The weather outside was extremely cold, and it is said that their hair, wet with perspiration was frozen upon their heads, and the drive to their homes afterwards was long and very cold. These two men, aged 20 and 22 respectively, developed cerebro-spinal meningitis next day. Immediately afterwards the disease

became epidemic, appearing in many different places in Ocean, Midland and Lonaconing, at about the same time. After every marked fall of temperature there were fresh cases to record, and the disease has prevailed there in varying intensity up to the present time. So far there have been sixty-eight well marked cases besides some forty which were classed as "abortive," making a total of over one hundred cases.

Of the sixty-eight patients in which the symptoms were clearly defined, thirty-seven were males and thirty-one females. In other epidemics, the number of females attacked has, as a rule, slightly exceeded that of the males, and it would seem probable, therefore, that sex bears little if any relation to the ætiology of the disease. Undoubtedly children and young adults were most susceptible, although the occurrence of the disease among older people cannot be denied, one of our cases being a man of 38 years, another a woman of 40. The youngest patient observed was a child of five months.

In studying the epidemics of cerebro-spinal meningitis which have occurred from time to time in different parts of the world, we can find no one factor or constant series of conditions which can be said to have existed in all. The disease varies greatly both as regards locality and the season of its visitation, and no particular class or condition of people is especially affected, but the strong and the weak seem to suffer alike. It is established now that the disease attacks by preference young individuals, the apparently robust, however, being as often affected as those in depraved health. In this report we have thought it unnecessary to describe in detail the previous epidemics of the disease in this and other countries. We shall refer briefly to such examples as may be useful for the better understanding of the present epidemic.

In an epidemic which appeared in 1890 in certain of the eastern counties of England, which has been studied by Low, the parishes affected all lay within

short distances of one another. The communities affected were agricultural, and the house refuse was used for fertilizing purposes. The drinking water was obtained from wells and from open pits, though water from the latter is said to have been boiled before being used.

The epidemic that prevailed at Hamburg, which was studied by Wolff, throws no light on the problem of the relation of the disease to particular localities or to special conditions of soil and water. But it is to be noted that in this epidemic the disease which had died out in a certain quarter started up there again after a considerable period of quiescence.

As an illustration of the fact that season does not play an important role are the observations of Strumpell, who studied an epidemic in Leipzig. The disease appeared there in 1879, continued into 1880 and '81, beginning in the winter and becoming more severe in April and June, almost ceasing in February and March of 1881, only to appear again in a sporadic form later.

On the other hand, the epidemic which we are describing appeared in the winter, and reached its maximum in February, during the coldest weather. The present winter has, moreover, been remarkable for its severity, and there have been heavy falls of snow, with very cold weather, alternating with thaws of short duration. Osler states that epidemics have occurred most frequently in winter and spring, and that villages and country places have, in certain of these, suffered more than cities. He adds, that in 1873 the disease prevailed along the valley of the Ottawa, in villages and country places, much more severely than in the cities of Montreal and Ottawa.

Claevrie described an epidemic at Rochefort, which prevailed during the winter of 1885-86, in which there were marked oscillations of temperature, although at no time did the thermometer fall below zero. Again, Lemoine observed, in the epidemic at Orleans during the winter of 1886, that a sudden lowering of the tem-

perature was followed in one or two days by a fresh outbreak of the disease.

The epidemics and sporadic outbreaks of cerebro-spinal meningitis which have occurred since 1886 are of especial interest, inasmuch as the disease since that time has been studied from a bacteriological standpoint. These investigations have been rewarded by the isolation of a particular micro-organism from the exudate, the *micrococcus lanceolatus*, which it is now believed bears an ætiological relation to the disease.

Weichselbaum found this organism in the exudate in the meninges in 1886, and Netter obtained the same organism from cases in the epidemic studied by Lemoine in the same year. Goldschmidt isolated it from a case in 1887, Ortman in 1888, and Foa and Bordoni-Uffreduzzi in an epidemic occurring in Turin in 1888. Banti found it in 1889, and Bonome obtained it at autopsies during a small epidemic in Padua, which occurred in 1890. Klippel found it in sporadic cases in 1891, and Ribbert in 1892. Ribbert's cases occurred in two brothers, who were affected almost simultaneously, and one of whom died in forty-three, the other in forty-seven hours.

The first to isolate the micrococcus lanceolatus from the exudate in miningitis was Eberth, in 1880. The meningitis was, in this case, secondary to pneumonia. Meningitis, associated with acute lobar pneumonia, has been studied by a considerable number of investigators, Bozzolo and Leyden, in 1883, Weichselbaum and Fraenkel, in 1886, Meyer and Netter, in 1887, Hansen and Bonome, in 1888, Monti in 1889, and Gabbi and Puntz in 1890. In Dr. Welch's laboratory, during the last few months, from two cases of meningitis complicating pneumonia, we have been able to isolate the same micro-organism.

There is another series of cases in which meningitis develops in the course of other affections or following injuries. In some of these the micrococcus lanceolatus has been found, in others, different bacteria, e. g., the

staphylococcus pyogenes aureus, the streptopoccus pyogenes, the bacillus pycoyaneus, and finally a bacillus resembling the typhoid bacillus. The diseases in which one or other of these organisms has been found in the exudate due to the secondary meningitis are acute ulcerative endocarditis, peritonitis, otitis media and diseases of the nasal mucous membrane. We have recently made an autopsy on a young man dead of meningitis who had previously met with an injury to his head in consequence of a fall. There was contusion of the scalp, but no loss of continuity in the bones of the skull. In the exudation from the meninges the micrococcus lanceolatus was found.

While the number of observations in which bacteriological examinations have been made on uncomplicated cases of meningitis occurring either sporadically or in epidemics is up to the present time not large, yet thus far there is such uniformity in the results obtained that it may be considered established that the micrococcus lanceolatus, an organism which in morphological characteristics and biological properties is indistinguishable from the organism which causes acute lobar pneumonia, is the cause of the disease.

During our stay at Lonaconing two deaths occurred, and we were fortunately able to secure autopsies. The first case was that of a child of nine years, who died on the third day of the disease. The autopsy showed an extensive convexity—meningitis with spinal meningitis. There was a fibrino-purulent exudation into the menges of the brain, extending over its surface and dipping down between its convolutions and involving the surface of the cord, particularly on its posterior aspect. In the pus from the brain and cord in coverslip preparations made at the autopsy the micrococcus lanceolatus only and no other organism was demonstrable. This micro-organism was found both in the pus cells and in the exudate between them.

The second autopsy was on a girl of sixteen, who died in the third week of the disease. In this case

there was an extensive fibrinous exudate over the base of the brain, with a large serous effusion into the posterior fossa. In the lateral ventricles, which were much dilated, and in the fourth ventricle considerable collections of thick, greenish gelatinous pus were present. The posterior surface of the cord was covered with a thick exudate which, although becoming thinner in front, almost entirely enveloped the whole cord. The exudate extended along the course of the auditory nerve, in the facial canal. Cover-slip preparations from the pus in different parts showed the lanceolate cocci to be present, but they were less numerous than in the previous case.

There was no pneumonia in either case, but in both the intestinal mucous membrane was considerably congested and the follicles swollen.

PATHOLOGICAL ANATOMY.

The changes in the central nervous system in cerebro-spinal meningitis have been studied by Strumpell, Campe and many others. They are not always of the same kind, but depend somewhat upon the duration of the disease. In the explosive cases it is not unusual for actual evidences of inflammation in the brain and cord to be entirely wanting as far as the microscopical examination is concerned. The appearances presented are those of intense hyperaemia with, perhaps, slight exudation of serious character, but the microscopical examination of such cases shows that there has already occurred a tolerably rich emigration of leucocytes into the pia-arachnoid.

In the cases in which death has taken place at a later stage, the evidences of inflammatory alterations in the membranes of the brain and cord are often very striking. And moreover, these changes are not necessarily limited to the membranes alone as the name of the disease might imply, but the substance of both brain and cord may be, and probably is, commonly in-

volved, although the degree of its participation in the morbid process varies greatly. While the inflammatory process in the substance of the brain and cord can generally be only appreciated with the aid of the microscope, yet in some instances, as pointed out by Zenker and Klebs, and more recently by Strumpell, abscesses of comparatively large size may exist.

The exudate consists of pus cells, red blood corpuscles, fibrin and serum in varying proportions. The amount of the serious exudation more particularly is inconstant, and in one instance reported by Stille it amounted to three pints, death however not having resulted until the thirty-fifth day of the disease. The exudate fills the meshes of the pia-arachnoid, but the ventricles of the brain and central canal of the spinal canal may contain the inflammatory products. The changes which have been described in the parenchymatous structures of brain and cord consist mainly of swelling of the axis cylinders and degeneration of the ganglion cells. The extension of the inflammation along their course gives rise respectively to the symptoms referable to involvements of the optic and auditory nerves.

The alterations found in other organs of the body cannot be said to be peculiar to this disease, but are such as attend infectious diseases in general. Among these may be classed hemorrhages into the serous membranes and into the substance of certain organs; the swelling, increased granulation and even fatty degeneration of the cells of parenchymatous organs; and the hyperæmia and degeneration of the voluntary muscles.

The two autopsies which we performed while at Lonaconing represented two types of the disease, the acute and subacute forms. Upon the child of nine, who died on the third day of the disease, the autopsy was made two hours after death.

There were no adhesions between the dura and the skull cap. The outer surface of the dura was smooth. The longitudinal sinus was filled with dark fluid blood.

Nowhere were the dura and pia-arachnoid adherent. The vessels of the pia were greatly dilated and filled with blood of a dark color. The soft meninges were swollen, but no considerable quanity of fluid escaped from them. They were opaque especially over the convexity of the brain and in the depressions between the sulci heavy opaque white streaks and bands were visible. This exudation into the leptomeninges was confined to the convex surface of the brain; the base was free from it, but the ventricles were somewhat dilated, and contained an excessive amount of clear serum.

The dura covering the spinal cord, especially in its inferior part, was wide and bulging. On incising it near the middle of lumbar region about 40 c. c. of slightly turbid fluid escaped. The spinal dura was not adherent to the pia. In the meshes of the latter was an exudate which was not uniformly distributed, but was most abundant posteriorly and corresponded for the most part with the lower cervical and dorso-lumbar regions. This exudation was white and opaque and resembled that present in the brain. The vessels of the pia of the cord were likewise injected, their contents dark in color. On section of the cord the substance presented a vivid pink tint.

There were subserous hemorrhages into the pleura and pericarium, and beneath the capsule of the kidney there were punctiform hemorrhages. The cut surface of the kidneys and liver presented an opaque appearance. There was no pneumonia, and the nasal sinuses were free from perceptible inflammation. The spleen was only slightly enlarged. Its color was darker than normal, its substance somewhat softened and the malpighian bodies were swollen and strikingly distinct. The mucous membrane, especially of the small intestine, was congested and the follicles were swollen.

The voluntary muscles were intensely red, and this was especially noticeable in those along the spine, and

a large amount of blood escaped from those in this situation on incision.

The bacteriological examination of the pus from the exudation in the meninges of the brain and cord showed the presence there of the micrococcus lanceolatus without admixture with any other organism. The micrococci occupied pus cells and were also present in the fluid among the cells. The cultures made from other organs, excepting the spleen, were sterile. In the spleen a streptococcus was found. It grew into chains consisting of ten to twenty members each.

The histological examination of the tissues from this case showed that an abundant exudation had taken place into the membranes of the brain and cord. This exudate consisted principally of leucocytes, with polymorphous nuclei, with an admixture of red blood corpuscles, serum and fibrin. The blood in the exudate varied, particularly in amount, at times only a few isolated or even no red cells being discernible in a part of a section, while in other portions larger hemorrhages were seen to have occurred. The inflammatory products forming the exudate were not limited to the meninges, although the involvement of the brain and cord themselves in this case did not reach a high degree. In the brain favorable sections showed a beginning extension of the inflammatory process in the meninges to the brain substance, the extension occurring in two ways, (1) along the small vessels which run in from the pia; and (2) by continuity from the pia independently of the vessels. The leucocytes could be followed into the brain substance a short distance only, and the total number of them was not considerable. Other inflammatory products were not seen in the brain, but the former presence of serum was indicated by the comparatively loose texture of the zone of brain substance just beneath the pia.

In the substance of the cord definite collections of pus cells occurred, but they were neither large nor numerous. The largest one observed was about the

size of a beginning sub-miliary tubercle. As far as could be seen, it had no connection with a blood vessel.

The spinal nerves, more especially their posterior roots, had been invaded by the inflammatory process. The inflammation had affected the interstitial tissue of the nerve as well as the perineural sheath, and in one instance, at least, a collection of leucocytes of considerable size occupied the former site of a nerve bundle. The fixed cells of the meninges had participated in the inflammatory process to no small extent. The part taken by them was evident in several situations, as, for example, brain, cord and spinal nerves. In the latter two it was seen in the pia-arachnoid, perineural sheath and interstitial neural tissue, but in the first it was especially striking and presented some peculiar features. In the meninges there were in some places collections of cells mingled with the leucocytes which were distinguished from the latter by their size, the staining propensities, by the character of their nuclei and certain other characteristics. These cells possessed nuclei of an epithelial type which varied in size and somewhat in appearance. The smaller cells, perhaps the young elements, possessed nuclei of the lymphoid type, while the longer ones contained distinct vesicular nuclei, their protoplasm being relatively more increased than the size of the nucleus. There were cells in all transitional stages between the small and the large cells, the latter being often equal in size to six or more of the smallest ones. The nuclei of these large cells were not of a corresponding size, but were on an average about as large as those of epithelial cells. Indeed in many cases they were not distinguishable from those of much smaller cells. The protoplasm was usually pale and granular, but what especially distinguished these large cells was the fact that they usually contained other cells within them. They were present in some places in such numbers as to form no inconsiderable part of the exudate, some containing as many as four, six or eight other cells in their protoplasm. The cells which

were usually found in them were leucocytes with polymorphous nuclei, although in some instances the peculiar form of nucleus which distinguishes this cell could not be made out, probably on account of the degeneration which it had undergone. But in the majority of instances the form of the nuclei was preserved and not seldom the protoplasm too of the included cell was distinguishable in the protoplasm of its host. As has been already indicated degenerated cells and cells of which fragments, some of which were nearly decolorized, alone were discernible, occurred in these cells. Moreover in comparatively few instances the large cells themselves seemed to have undergone degeneration. At least they were more opaque than usual, their nuclei could not be made out, and in eosine (the tissue having been hardened in absolute alcohol) their protoplasm stained more deeply than that of the other tissue elements.

These peculiar cells which we have just described are, we believe, derived from the fixed tissue elements, from the pia in all probability. This is indicated by the transition forms which exist between the smaller cells and the larger ones, as well as by their situation. What their function is we are as yet unable to say.

A section of the kidney hardened in Flemming's solution, showed an exquisite fatty degeneration of the convoluted tubules of the cortex. In the specimens hardened in absolute alcohol there was swelling and granulation of the epithelium of these tubules and here and there a cell which was devoid of a nucleus could be seen.

The spleen was filled with blood and its lymphatic tissue increased in amount.

The second case was that of a girl of sixteen, who died in the third week of the disease. The autopsy was made twelve hours after death.

The brain:—The dura was strongly adherent to the skull cap, and on separating the adhesions a considerable quantity (about 200 c. c.) of fluid escaped from be-

neath it. This fluid was slightly turbid and contained white flakes in suspension. The longitudinal sinus and the veins over the convex surface of the brain were distended with dark fluid blood, and the arteries were prominent. The fluid in the pia over the cortex generally was turbid. On the base covering the pons and the upper half of the medulla was a firm white deposit which was intimately adherent to the underlying tissues. Over the base, from the pons to the optic chiasm inclusive, there was in the pia a fluid, milk white in color, which was especially marked in the anterior space and over the optic commissure. The fourth ventricle and the lateral ventricles contained greenish yellow gelatinous pus, indeed the former was completely filled with it. Both the lateral ventricles were dilated and the choroid plexuses covered with an opaque exudate. This extended along the sheath of the auditory canal into the facial canal.

The Cord. The pia-arachnoid throughout the entire length of the cord on the posterior surface contained a gelatinous exudate fully one millimeter in thickness, the exudate on the anterior surface being less marked.

The kidneys were swollen, cloudy and cyanosed. The liver was cloudy and of very flabby consistence. The spleen was somewhat swollen, softened and deep reddish-brown in color, the malpighian bodies being very distinct. The intestines were swollen throughout, congested, and its lymphatic apparatus was hypertrophied. There was no pneumonia.

Bacteriological Examination. From the pus in the ventricles and the exudate over the base of the brain the micrococcus lanceolatus was obtained. The organisms were present in much smaller numbers than in the previous case. In the other organs no bacteria were found.

Histological Examination. The exudation over the base of the brain consisted of pus cells with a considerable admixture of cells of the connective tissue type. These latter were small round cells with nuclei

of a lymphoid character. In the ventricles the pus also contained similar round cells, and in addition many typical cells with polyform nuclei. Around the vessels which run in from the pia over the base, these round cells, in varying numbers, were found, sometimes forming large masses. The largest aggregations of these cells were seen in the brain substance near the ventricles. The epithelial covering of the ventricles themselves was in part preserved. Where it was deficient there were along the edge cells in rows two and three thick, containing nuclei of a vesicular type. But in the brain substance along the vessels were large collections of round cells with an occasional leucocyte (nucleus polyform) mixed with them.

The cord showed likewise a thick exudate, which consisted in large part of pus cells with polyform nuclei, but some small round cells were present here also. In the pia-arachnoid just beneath the dura there was a considerable proliferation of fixed cells. In the membranes of the cord the large cells described as having been observed in the pia of the brain in the first case, and which had included other cells, were again seen. They were not so numerous as in the first case, but were by no means rare. In the substance of the cord are collections of cells around the vessels which present the same characteristics as those in the brain, and form quite extensive aggregations.

The fresh liver tissue on section was cloudy and the lobules were very indistinct. The microscope showed small collections of leucocytes here and there in the neighborhood of the portal spaces. There were no marked areas of necrosis, but single cells showed altered deeply staining nuclei surrounded by protoplasm which stained more intensely than normal in solutions of eosin.

In the kidneys the stellate veins were prominent, and the surface bluish red in color. On section there was evidently marked congestion, the striæ were distinct and fine and the malpighian bodies red.

There was general hyperplasia of the lymphatic apparatus of the spleen. Its venous sinuses were filled with blood and in some places there had been actual hemorrhages of considerable size into the parenchyma of the organ. A few "red blood corpuscle carrying cells" were seen, many of them containing also blood pigment.

Symptomatology. Regarding the symptomatology we shall content ourselves with giving a very brief resume of the notes taken. The onset of the disease was in the majority of the cases sudden, the individual being attacked with severe headache, and vomiting, which were followed in a few hours by delirium, stiffness and retraction of the neck and severe constitutional symptoms. In only a few cases was there a definite, recognizable prodromal stage with general malaise, headache and dragging pains in the limbs. Compared with other epidemics the number of explosive (foudroyant) cases was large, no less than ten patients dying within forty-eight hours after seizure, one child indeed succumbing in eight, and another in ten hours after the appearance of the first symptoms. In the less violent but still severe cases, the main symptoms lasted from six to fourteen days when either death occurred or signs of slow improvement ensued. Many abortive cases were observed in which, after a sudden onset, with perhaps severe symptoms, the patients recovered with striking rapidity.

Several cases of the "intermittent type" occurred during this epidemic, and in these, period of comparative well-being alternated with marked exacerbations. The convalescence was often tedious, and the danger was by no means over when the acute symptoms had subsided.

The symptoms in general, we may say, presented no regularity. The disease is full of surprises, and the clinical phenomena of one day or hour may differ greatly from those of the next.

Especially in constant is the course of the fever, and

the temperature charts are interesting chiefly in that they show that no fixed type of pyrexia can be definitely assigned to this disease, nor did the height of the fever bear any relation to the severity of the symptoms; the sudden and often marked elevations and depressions of the temperature, independent of the general symptoms, could be explained only by assuming a direct interference with the functions of the thermo regulatory centres.

The other symptoms referable to disturbances of the central nervous, the headache, the vertigo, the delirium, the eye muscle paralyses, the deafness, the general hyperaesthesia and the twitchings, showed almost as great irregularity as did the temperature curve.

Among the clinical appearances noted due to lesions of the cranial nerves and their centres in the different cases may be mentioned, anosmia, strabismus, most frequently divergent, nystagmuss usually horizontal or vertical, in one case rotatory, inequality of pupils, ptosis, defects of vision, facial rigidity, trismus, slowed respiration, Cheyne-Stokes breathing, deafness, and disturbances of speech.

The retraction of the neck was very commonly present; in some cases the occuput was thrown back between the scapulæ. The thighs and legs were frequently flexed but extreme opisthotonas was not often seen. There was general hyperaesthesia of the skin, and attempts to change the position of a patient gave rise to severe pain. In the graver cases there were marked twitchings of the muscles and tendons, and in some convulsions and coma.

The tendon reflexes varied much, but in many cases were diminished, which is to be attributed, no doubt, to the extent of the interference with the posterior roots of the spinal nerves.

Beyond the nervous arhythmia the respiratory organs were not markedly implicated, and it was only rarely that one met with an associated bronchitis or broncho pneumonia. General cyanosis was not uncommon.

One very frequent feature in this epidemic was epistaxis, a symptom which does not seem to have attracted the attention of observers elsewhere.

The pulse was sometimes slowed, sometimes accelerated, and there was no evidence of implication of the heart and pericardium in any of the cases examined.

The blood examination showed that the disease does not, in the acute stage, affect materially the number of red corpuscles or their amount of hæmoglobin. It is, however, associated, as might have been expected, with an acute leucocytosis, there being at the height of the disease from twenty to thirty thousand white corpuscles to the cubic millimetre. This increase is due almost entirely to an augmentation of the number of the neutrophilic leucocytes with polymorphous nuclei.

The lips, teeth and tongue were covered with sordes, especially in the graver and more protracted cases. A few patients showed mild anginas, and the tonsillar crypts were not infrequently filled with white cheesy-looking plugs. The chief symptom pertaining to the digestive system was the vomiting, which in some cases was persistent, leading to inanition and emaciation. The bowels, were as a rule, constipated, although diarrhoea occasionally occurred. Indeed, in four cases, a well marked dysentery was observed, with frequent stools, the faeces containing mucus, pus and blood. The bacteriological examination of the pus from one of the stools, as we shall mention later, showed the presence of the micrococcus lanceolatus in large numbers. Occasionally in a grave case there would be incontinence of both urine and faeces.

The spleen, was at times, slightly enlarged, but in no instance was it palpable. Abdominal retraction was not a prominent symptom on the whole. The only symptom referable to the liver was the occurrence of mild jaundice in two of the cases.

The skin changes were widely divergent. Many of

the cases ran their course without any apparent exanthem. Herpes was very common and formed an early and important symptom. It was situated chiefly in the lips, nose, ears, and neck. Purpuric and petechial eruptions were seen in a small proportion of the patients. One of the commonest forms of eruption was an indistinct mottling over the surface of the body, which appeared and disappeared almost under the eyes.

The urine in the acute cases contained a small amount of albumen and a few hyaline and granular casts. Ehrlich's diazo-reaction was not present.

Nearly 20 per cent. of the severe cases had complicating joint affections (intra and peri-articular effusions), the knee being most frequently attacked, the elbows, wrist and ankle following in frequency in the order named.

As to sequelae in general, it is as yet too early to speak with any degree of certainty. Judging from experiences elsewhere permanent deafness, blindness, and paralysis may be expected at least in a certain proportion of the cases.

The death-rate corresponds to that of an epidemic of moderate severity, about 40 per cent. of the cases (excluding those classed as abortive), proving fatal. Hirsch, in his monograph, states that out of 15,632 cases 37 per cent. died. Von Ziemssen placed the mortality of mild epidemics at 20 per cent. and of the severest epidemics at 70 per cent.

It is too soon to state exactly the death-rate in the Lonaconing epidemic, as many patients are still ill. One girl is now in the eighth week of the disease and is so enfeebled and emaciated that she will probably die.

Pathogenesis. The disease then being known to be due to the action of a specific micro-organism, viz.: the micrococcus lanceolatus, we have next to consider by what mode the infectious agent gains entrance to the body and into the meninges of the brain and cord, and in which way, if at all, it is thrown off. Again

we have to enquire whether, if it can be thrown off, it will ever then be in a condition to infect other individuals.

Unfortunately a wholly satisfactory answer cannot at this time be given to these questions. We are not yet in possession of sufficient data based on a close study of the epidemiology and bacteriology of the disease, to enable us to more than indicate the probable mode of infection and the conditions which predispose to the origin and propagation of the disease.

The simultaneous prevalence of other infectious diseases in the localities in which epidemic cerebro-spinal meningitis existed has been held to be of some significance. The occurrence of pneumonia at such times must be regarded as of great importance, for as we have said, the same infectious agent is the cause of both diseases, and in the epidemic studied by Foa and Bordoni-Uffreduzzi, the most of the cases were complicated by pneumonia. Next epidemic parotitis has been noted as occurring in a community in connection with or just before the outbreak of this disease. Parotitis was epidemic at Lonaconing at the time of the prevalence of meningitis, and we may remark that there is some likelihood that the micrococcus lanceolatus is the cause of this disease also.

Again, other infectious diseases, scarlet fever, measles, typhoid fever, influenza and coryza, have been mentioned by different writers as concomitant epidemics.

While in pneumonia and probably a certain number of cases of parotitis the same organism as that found in meningitis is known to occur, yet in the other infectious diseases mentioned, the infectious agent so far as least as is kuown at present, is in none of them the same. Moreover, it is to be remembered that meningitis does not attack by preference those suffering or just recovering from other infectious diseases, if we exclude pneumonia. These diseases occur as concomitants or precursors only.

Hence it is clear that in the search for predisposing factors we must look further than the infectious diseases with which epidemic meningitis may co-exist. And it is not improbable that we shall find that although the one disease does not depend upon the other for its development, yet the same conditions of life which permit one to flourish may also engender the other.

It has been suggested by Strumpell that there may be some relation between coryza and epidemic meningitis. This is made, he thinks, probable, on account of the observations of Weigert, that in some cases there is a purulent inflammation of the nasal sinuses. Weichselbaum found in these cases of meningitis purulent inflammation of the nasal and spenoidal sinuses and the middle ear, and in all he demonstrated diplococci. One must, we think, hesitate before accepting it as even highly probable that the majority of cases originate in this way. On the other hand, a sharp line of distinction must be drawn between these cases, which are definitely primary and those which are secondary. There are undoubtedly cases in which there has been an extension of disease of the middle ear to the meninges, and why should not the same thing happen in diseases of the nasal sinuses. Such cases may simulate the sporadic form of the disease. But what is necessary is to see whether or not cases associated with middle ear and nasal diseases occur in such numbers during an epidemic as to make this mode of origin the probable one in all. In the acute case in which we performed an autopsy no disease of the nasal sinuses had existed.

These are considerations which would seem to make it more probable that we have to do with an infection by the way of the blood current rather than by continuity from the nose or ear. The common occurrence of meningitis in pneumonia indicates the possibility as well as the frequency of this mode of infection. In those cases in which pneumonia does not occur, other sources of entrance for the infectious agent must be

sought; and to this category belongs especially the epidemic form. In any consideration of this subject at the present time infection from the nasal and oral cavities, in the latter case by lymphatic communication, as suggested by Ortmann, is a possibility which cannot safely be rejected. Nevertheless, we have been led to believe that *the intestinal tract* may be regarded as the way of entrance if not in all, at least in many cases.

In two of the cases which we observed clinically, and which afterwards proved fatal, there was dysentery. Cultures and cover-slip preparations were made from the evacuations of one of these, and the predominating organism present was the micrococcus lanceolatus. In both of the cases which came to autopsy there was enteritis, and in other epidemics the occurrence of dysentery has been noted. Yet constipation is a feature of the disease of more common occurrence than diarrhœa, and this may be considered at first as militating against the conception of the intestinal tract as the place of entrance into the body of the infectious agent. But it seems perfectly conceivable that the organisms may enter through the intestinal canal without first producing a lesion therein, and find in the central nervous system a *locus minoris resistentiæ*. The case of meningitis reported by Ortmann as due to the micrococcus lanceolatus secondary to typhoid fever is suggestive in this connection.

Owing to the slight vitality of the organism in acid media, and as the intestine must become invaded after the infectious material has first passed trough the stomach, it is necessary to draw attention to a fact which we were able to demonstrate in one case and that may be of significance. Whether in the persons attacked there is an alteration in the gastric juice by which its acidity is either diminished or altogether abolished, we cannot say, as we were unable to obtain the contents of the stomach from a number of cases. But in the vomit obtained from one child sick of the

disease, free hydrochloric acid was demonstrated to be absent. Still were this not the rule there are periods in health during the fasting hours when the stomach is free, or nearly so, from acid contents.

The importance of considering the intestine as a probable infection-atrium in epidemic cerebro-spinal meningitis becomes evident when it is remembered that about 80 per cent., and according to some others (Kruse and Pansini), 100 per cent. of all persons in health carry about constantly in their mouths the micrococcus lanceolatus, and according to Netter, in 20 per cent. of these the organisms possess sufficient virulence to kill animals, when injected into them. This fact removes the necessity of searching for the infectious agent outside the body in, for example, the soil or the water, and the slight vitality of the organism even under favorable conditions, must be a strong argument against the infection taking place from without.

Most writers on the subject now agree that the disease is not contagious, but is rather of miasmatic origin. The localization of the infectious agent in the closed cavity of the central nervous system certainly does not favor the infection of the surroundings. Still in some epidemics, that in Hamburg for example, the disease was known to appear in a locality in which it previously existed, but from which it had disappeared, and the interval of time which elapsed was in some instances considerable. These facts would seem at first to be irreconcilable with the view that there is no infection of locality. In the first place we now know that an organism possessing the cultural and morphological properties of the micrococcus lanceolatus is thrown off with the dejections in these cases, and, as indicated by the experiments of Foa and Bordoni-Uffreduzzi, it may be worth while to consider that in blood the organism may retain its vitality for a considerable time and live at the freezing temperature for about two months. This assumption seems, however, in view of

the wide distribution of the organism in nature, to be hardly necessary. It is, we think, more probable that the local conditions which enabled the first cases to appear may persist and susceptible individuals be attacked, so that a second epidemic appears.

If we are then to believe, as it seems we must, that the disease is in the majority of instances an auto-infection; and this would be equally true whether we conceive it to be due to the entrance of the bacteria from the pharynx or from the intestinal canal, it still remains for us to determine the nature of the unusual conditions, which render the system vulnerable to the invasion of the micro-organism, and what it is that brings about the localization by preference of the morbid process in the cerebro-spinal meninges.

By the exclusion of air, water, soil and food as the carrier of the infectious agent we by no means mean to deny that they may play an important role in the causation of the disease. The local conditions of Lonaconing are such as would naturally produce a lessening of the powers of resistance of a number of individuals and thus render them, although apparently in good health, an easy prey to the disease. In this epidemic it was chiefly the poorer classes which suffered, and the disease prevailed particularly in localities in which the houses were close together, and in which overcrowding existed, with the attendant evils of unsanitary arrangements, improper and insufficient food, and unclean bedding and clothing. Nevertheless, the more prosperous classes were by no means exempt.

We should also add that in the two cases that came to autopsy large lumbricoid worms were found in the alimentary canal, and on inquiry we learned that they had been observed in many of the cases, both in the vomitus and in the faeces.

CONCLUSIONS.

We earnestly recommend certain improvements in the local sanitary conditions of Lonaconing and the surrounding villages. It is, so far as the conditions of the place are concerned, immaterial whether we regard the actual cause of the disease to be due to infection from without or from the individual himself. Whichever it may be, the indications are the same. The local unsanitary condition is to be regarded either as the direct or the indirect excitor of the epidemic. There can be no doubt that the room for improvement in these conditions is considerable, and we would respectfully submit the following suggestions:

The creek, which by the percolation of its waters through the soil, furnishes the well water, or contaminates it, should be so guarded as to prevent any further contamination of the water supply from this source. This could be accomplished by a system of drains which would carry the washings and waste into the creek at a point below the town.

Direct contamination of the soil from the percolation through it of infected material from houses could be avoided by this system of drains. The evil is one which is constantly increasing, and it is imperative that it should be removed. The surface washings which pass into the water might be disposed of in the same manner.

The slaughter-houses which now pollute the streams with their offal should be compelled to abandon these practices and secure some other and inoffensive mode of disposing of their waste; and if this be not possible they should be removed to other quarters. The practice of depositing waste of any kind in the creek or on its borders, especially dead and decaying animals, should be prevented by stringent ordinances.

The waste material, such for example as kitchen waste, refuse from privies and stables, which accrues from households, should be disposed of in an inoffensive

and secure manner. It is unnecessary to suggest to the Board which of the many feasible ways of accomplishing this should be adopted.

The stagnating filth which now lies in the streets, alleys and roadways should be removed without delay. Their removal should not only embrace their transfer from one place to another where they will be out of sight, but should mean the disposal of them in a manner which will put them where they can be the source of no contamination to inhabited places and their surroundings. Having once secured the cleanliness of the town it should be maintained by strict ordinances.

An investigation should be made by the proper officers, and where overcrowding in houses is found to exist measures should be taken to prevent the continuance of this evil. Where, from unavoidable circumstances, the families are found to be too poor to provide them for themselves, sufficient beds and bedding should be supplied.

Until these or such similar changes as many seem advisable, shall have been made it is imperative that all the water used for drinking and culinary purposes should be boiled and afterwards protected from contamination.

Finally, we would urge upon the people of Lonaconing, as a community and as individuals that it is their duty not only to co-operate heartily with the proper authorities in trying to put their town in as thoroughly a hygienic state as possible, but by the observance of the laws belonging to personal hygiene, by the avoidance of excesses of all kinds, of exposure to cold or to sudden changes of temperature and by hadits of personal cleanliness, to render more effective their natural powers of resistance, and thus reduce to a minimum the conditions which are favorable to the spread of epidemic diseases of all kinds.

SIMON FLEXNER,
L. F. BARKER.

APPENDIX.

BALTIMORE, January 1, 1894.

To the Secretary of the State Board of Health:

I herewith tender my report for the year 1893, as Fish Inspector, since my appointment, April 20, 1893:

Number of inspections..... 1,750

Condemned	.....	20,055 pounds of fish.
"	.....	1,500 dozen crabs.
"	.....	1,050 pounds turtles.
"	.....	445 pine apples.
"	.....	4,000 oranges.
"	.....	140 rabbits.
"	.....	350 pounds poultry.
"	.....	60 dozen eggs.
"	.....	11 barrels of oysters.
"	.....	150 gallons of oysters.
"	.....	7 barrels sprouts.
"	.....	350 pounds grapes.

There has been a remarkable improvement among dealers in keeping better and fresher articles on their stalls, and I find that the system of inspection gives more confidence to purchasers of the above articles of food.

Respectfully submitted,

JOSEPH M. ANDERSON,
Fish Inspector.

INDEX.

INDEX.

A

PAGE.

Abattoirs..... 56
Analyses, Potomac above Pulp Mill.....61–63
Analyses, Catonsville water supply.....82–85
Analyses, Baltimore City water..... 86
Analyses, Mt. Airy water 88
Analyses, Lake Roland water..... 102
Analyses, Lake Roland and tributaries.....114–115
Analyses, Elkton water 120
Analyses, Hagerstown water.....126–127
Analyses, Mt. Savage water..... 128
Analyses, City water, by C. P. VonGundy..... 169
Analyses, City water, by Prof. Penniman 130
Analyses, City water, Loch Raven, by Prof. Penniman 131–132
Analyses, Towson water..... .....144–1 5
Analyses, lead poisoning..... 152–155
Analyses, Cumberland water..... 61–64
Address to County Boards 12
Analysis Mr. Samuel Hunt's well..... 117
Analyses, water, Garrett property..... 136

B

Bordley, Dr. James, reports.....27-34
Bateman, Dr. J. M. H., report..... 37
Bird, Dr. B. L., report 39
Bateman, Dr. J. M. H., report..... 40
Billingslea, Dr., report..... 40

C

Chancellor, Dr. C. W., letter..... 7
Carter, John M. Jr., report..... 148

PAGE.
Cerebro-Spinal Meningites, report..... 180
Chancellor, Dr. C. W., Complimentary Resolutions of the State Board..... 68
County Health Officers, report of..... 20
Cumberland Water Supply..... 60

D

Duke, Dr. E. T., report..... 27
Duke, Dr. E. T., report..... 44
Douglass, Dr. E., report on lead poisoning..... 146

E

Election, Secretary State Board of Health..... 8

F

Financial Statement of Secretary Steuart for quarter ending December 31, 1893..... 76
Financial Statement of Secretary Steuart for eight months, May 1st, to September 30th, end of fiscal year of State Treasury..... 167
Financial Statement of Dr. C. W. Chancellor..... 174

H

Hines, Dr. W. Frank, report..... 26
Hines, Dr. W. Frank, report..... 42
Hunt, Samuel, Esq., letter..... 116

I

Introductory..... 9
Inspection dairy farms of Maryland..... 94
Inspection dairy, Woodstock..... 98
Inspection dairy, Claremount..... 99
Inspection cattle, G. R. Godman..... 99
Inspection cattle, G. R. Godman..... 100

PAGE.
Inspection Hall's Station, B. & P. R. R..... 123
Ice analyses..... 165
Ice, natural, analyses..... 166
Inspection Cumberland water and surroundings.... 76

J

Jamar, Dr. John H., report..... 20
Jamar, Dr. John H., report..... 42
Jones, Dr. Geo. M., report..... 35
Jamar, Dr. J. H., letter..... 118
Jamar, Dr. J. H., letter..... 118

K

Kent County..... 71

L

Lake Roland and Tributaries 105
Letter to county Commissioners..... 10
Letter, Prof. Penniman..... 138
Letter Published, Baltimore Sun..... 48
Letter to Mayor and City Conncil, of Cumberland. 53
Letter, Prof. Penniman..... 60
Letter to Walter Wyman, M.D., S.S.G.M.H.S..... 66
Letter from A. M. Mount, Mt. Airy Water..... 86
Letter from Prof. Penniman same..... 86
Letter from Prof. Penniman Standards Pure Water. 91
Letter from Prof. Penniman Standards Pure Milk.. 93
Letter to Hon. F. C. Latrobe.....106-107
Letter to Secretary Steuart from Hon. F.C.Latrobe. 107
Letter, Samuel Hunt, from..... 116
Letter, Secretary Steuart..... 116
Letter, Dr. J. H. Jamar..... 118
Letter, Prof. Penniman..... 119
Letter, Dr. B. L. Bird..... 123
Letter, Jas. G. Smith, Mt. Savage..... 127

PAGE.
Letter, S. R. Barr..... 128
Letter, S. B. Hazelhurst..... 129
Letter, C. Nitze, about Garrett property..... 133
Letter, Luther Kemp, M. D..... 137

M

Maddox, Dr. C. J..... 35
Monmonier, Dr. J. C..... 36
Monmonier, Dr. J. C..... 39
Milk, report Prof. Penniman..... 159
Milk, analyses..... 162–163
Milk, analyses..... 164
Morris, Dr. John, President's report..... 167
Members State Board and Officers..... 2

N

National Conference State Board of Health..... 69

O

Ordered first analysis of Baltimore City water, July, 1893..... 66

P

Presentation to Governor and General Assembly... 1
Penniman, letter, lead poisoning cases..... 151
Penniman, letter, lead poisoning cases..... 155

Q

Quarterly—First, report, Secretary Steuart..... 48
Quarterly—Second, report, Secretary Steuart..... 52
Quarterly—Third, report, Secretary Steuart..... 70
Quarterly—Last, report of Dr. C. W. Chancellor, late Secretary State Board of Health..... 170

R

PAGE.

Resolutions of State Board, complimentary to Dr. C. W. Chancellor 68
Reports County Health Officers 20
Report John H. Jamar, M. D. 20
Report W. Frank Hines, M. D. 26
Report E. T. Duke, M. D. 27
Report Jas. Bordley, M. D. 27
Report Jas. Bordley, M. D. 32
Report Jas. Bordley, M. D. 34
Report C. J. Maddox, M. D. 35
Report George M. Jones, M. D. 35
Report J. C. Monmonier, M. D. 36
Report J. M. H. Bateman, M. D. 37
Report B. L. Bird, M. D. 39
Report J. C. Monmonier, M. D. 39
Report J. M. H. Bateman, M. D. 40
Report J. H. Billingslea, M. D. 40
Report John H. Jamar, M. D. 42
Report W. Frank Hines, M. D. 42
Report E. T. Duke, M. D. 44
T. W. Simmons, M. D. 44
Report, Inspector A. L. Brow, on Mt. Airy water and surroundings 88
Report on Receipts Live Stock at Union Stock Yards, by G. R. Godman 102
Report on shipments of Live Stock from Union Stock Yards, from January 1, 1893, to November 30, 1893 103
Report, G. R. Godman, Inspections for Dec. 1893 104
Report, Jos. M. Anderson, Fish Inspector 104
Report, Jos. M. Anderson, Fish Inspector 105
Report, Prof. Penniman on Lake Roland water 108
Report, A. L. Browne, Inspector on complaint about Garrett property 133
Report, A. L. Browne, about typhoid in Baltimore 136
Report, Prof. Penniman, Towson water 140
Report, Prof. Penniman, Uniontown 139
Report, A. L. Browne, Inspector 140

S

PAGE.
Simmons, T. W., M. D., report..... 44
Shipments of cattle from Union Stock Yards to Europe by months, January to December, 1893. 104

W

Water supplied to Cities, relative purity..... 121
Water, Baltimore, Lake Roland..... 122